



# *P*orta-PSTA Mass Balance (Destructive) Sampling Periphyton-Based Stormwater Treatment Area (PSTA) Research and Demonstration Project

*Prepared for*

**Florida Department of Environmental Protection  
and  
South Florida Water Management District**

*Prepared by*

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August 2001



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# Abbreviations and Acronyms

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AFDW	ash-free dry weight
Ca	calcium
cm	centimeter(s)
CompQAP	Comprehensive Quality Assurance Plan
District	South Florida Water Management District
DOP	dissolved organic phosphorus
DRP	dissolved reactive phosphorus
DW	dry weight
ENR	Everglades Nutrient Removal
IFAS	Institute for Food and Agricultural Sciences
g/m <sup>3</sup>	gram(s) per cubic meter
mg/L	milligram(s) per liter
P	phosphorus
PSTA	periphyton-based stormwater
QC	quality control
SAV	submerged aquatic vegetation
SRP	Scientific Review Panel
TDP	total dissolved phosphorus
TIP	total inorganic phosphorus
TOP	total organic phosphorus
TP	total phosphorus
TPP	total particulate phosphorus
WAR	Water and Air Research



# Acknowledgements

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# Executive Summary

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# Executive Summary

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The South Florida Water Management District (District) is conducting research focused on determining the effectiveness and design criteria of potential advanced treatment technologies to support reduction of phosphorus (P) loads in surface waters entering the remaining Everglades. Periphyton-based stormwater treatment areas (PSTAs) are one of the advanced treatment technologies being researched by the District for potential application downstream of the macrophyte-based stormwater treatment areas (STAs).

Twenty-four portable PSTA (Porta-PSTA) mesocosms were operated by the CH2M HILL project team for approximately 18 months as part of the PSTA Research and Demonstration Project sponsored by the District. Routine monitoring of the Porta-PSTAs was completed in early October 2000.

One aspect of the Porta-PSTA research was the documentation of input/output mass balances for water and total phosphorus (TP). Mass balance work under the District contract was solely dependent on calculated inflow and outflow data coupled with analysis of sediment and some of the biological data. With the support provided by the Florida Department of Environmental Protection (FDEP), supplemental final mass balance “destructive” sampling was conducted on 10 of the 24 Porta-PSTA mesocosms on February 13, 14, and 15, 2001, to better characterize the total mass of organic matter, P and calcium present in the mesocosms. For this supplemental analysis study, the following Porta-PSTAs were sampled:

- Peat Treatment PP-3 (Tanks 12, 14, 17)
- Shellrock Treatment PP-4 (Tanks 3, 5, 10)
- Sand Control Treatments PP-7 and PP-17 (acid-washed) (Tanks 19, 20)
- No Substrate Control Treatment PP-18 (Tank 21)
- No Substrate Aquamat Control Treatment PP-19 (Tank 22)

Exhibit ES-1 presents a treatment summary of the total mass of TP, calcium, and ash-free dry weight (AFDW) biomass (organic matter) present for each compartment in each Porta-PSTA at the time of the final mass balance sampling.

## AFDW Biomass

Macrophytes were the primary biomass compartment for the peat-soil mesocosms with 614 grams (g) AFDW/ per square meter ( $m^2$ ). Periphyton biomass in the peat treatment was much lower, with an average of 78 grams AFDW/ $m^2$ . The shellrock treatment biomass was fairly evenly distributed between macrophytes and periphyton, with averages of 304 and 215 g AFDW/ $m^2$ , respectively. The sand treatments had a more even distribution of AFDW biomass between the periphyton and macrophyte compartments, with all averages near 200 g AFDW/ $m^2$ . The non-soil control treatments had periphyton biomass (approximately 300 g AFDW/ $m^2$ ) slightly above the shellrock and sand soil treatments. Consumer biomass was negligible compared to plant biomass in all treatments (1.3 g AFDW/ $m^2$  or less). Total



**EXHIBIT ES-1**

Summary of Porta-PSTA Final Mass Balance Sampling, February 2001

Treatment Number Substrate	PP-3 Peat	PP-4 Shell	PP-7 Sand	PP-17 Sand	PP-18 None	PP-19 Aquamat
<b>Biomass (g AFDW/m<sup>2</sup>)</b>						
Periphyton	78	215	249	177	296	309
Macrophytes	614	304	223	183	0	0
Consumers	0.9	0.1	0.3	0.0	1.3	2.0
Total	693	519	472	360	297	311
<b>Total Phosphorus (mg/m<sup>2</sup>)</b>						
Water	6.1	4.1	4.0	6.9	3.4	3.6
Periphyton	95	391	626	220	184	273
Macrophytes	320	230	195	180	0	0
Consumers	5.3	0.1	2.5	0.0	5.7	9.1
Soil	9,460	270,701	5,625	5,675	0	0
Total	9,886	271,327	6,453	6,082	193	285
<b>Calcium (g/m<sup>2</sup>)</b>						
Periphyton	15.1	202.9	235.8	116.8	268.5	295.4
Macrophytes	4.8	11.0	1.4	2.2	0	0
Consumers	0.2	0.0	0.1	0.0	0.8	1.0
Soil	8,730	43,663	834	216	0	0
Total	8,750	43,877	1,071	335	269	296

Number of replicates: PP-3 (3), PP-4 (3), PP-7 (1), PP-17 (1), PP-18 (1), PP-19 (1)

ending biomass in all treatments ranged from a low of 297 g AFDW/m<sup>2</sup> in the non-soil control tank to a high of 693 g AFDW/m<sup>2</sup> in the peat mesocosms.

## Total Phosphorus

The soil compartment had the highest TP content for all media sampled in the Porta-PSTAs. The shellrock treatment had the highest average soil TP (270,701 milligrams [mg] P/m<sup>2</sup>), the peat soils averaged 9,886 mg P/m<sup>2</sup>, and the sand treatments had relatively equal soil TP averages (5,625 and 5,675 mg P/m<sup>2</sup>). Excluding the soil compartment, periphyton (floating/metaphyton, benthic, and wall mat) had the highest TP content in all treatments (varying from 184 mg P/m<sup>2</sup> to 626 mg P/m<sup>2</sup>), with the exception of the peat treatment. Macrophytes were the next dominant TP component (after soil) in the peat treatment, with an average TP of 320 mg P/m<sup>2</sup>. Consumer populations and water in the Porta-PSTA mesocosms have relatively insignificant quantities of TP compared to the soil and plant components.



## Calcium

When present, the soil compartment had the highest calcium (Ca) content for all media sampled in the Porta-PSTAs. The shellrock treatment had the highest average soil calcium content (43,663 g Ca/m<sup>2</sup>), the peat-soil treatment averaged 8,730 g Ca/m<sup>2</sup>, and the two sand treatments (PP-7 and PP-17) had 834 and 216 g Ca/m<sup>2</sup>, respectively. Excluding the soil compartment, periphyton had the highest calcium content in all treatments. The peat treatment had the lowest periphyton calcium content (15.1 g Ca/m<sup>2</sup>), while the Aquamat treatment averaged 295 g Ca/m<sup>2</sup>. Consumers (primarily snails) accounted for a relatively insignificant amount of calcium.

# Introduction

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# Introduction

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## 1.1 Background

The South Florida Water Management District (District) is conducting research focused on determining the effectiveness and design criteria of potential advanced treatment technologies to support reduction of phosphorus (P) loads in surface waters entering the remaining Everglades. Periphyton-based stormwater treatment areas (PSTAs) are one of the advanced treatment technologies being researched by the District for potential application downstream of the macrophyte-based stormwater treatment areas (STAs).

Twenty-four Portable PSTA (Porta-PSTA) mesocosms were operated and studied by the CH2M HILL project team for approximately 18 months as part of the PSTA Research and Demonstration Project sponsored by the District (Contract C-E8624). Monitoring of the Porta-PSTAs began in April 1999 and was completed in early October 2000. These mesocosms are located within the District's Everglades Nutrient Removal (ENR) project area at the South Advanced Technology Research Compound, and represent the smallest scale of PSTA research. For this reason, they are the only PSTA research platform (scale) that reasonably could be completely sampled for a quantitative final assessment of biomass, P, and calcium. Larger mesocosms (PSTA Test Cells) were monitored for approximately 26 months (through March 2001) under the same District contract, and studies of Field-Scale (demonstration) PSTAs are currently under start-up mode.

One aspect of the Porta-PSTA research was the documentation of input/output mass balances for water and total phosphorus (TP). Recommendations from the PSTA Scientific Review Panel (SRP) and other project reviewers during the September 9 and 10, 2000, and the January 13 and 14, 2001, SRP workshops included performance of final mass (destructive) sampling of a subset of the Porta-PSTAs to support the mass balance analyses. Mass balance sampling included organic matter, P, and calcium for all living and non-living components of the mesocosms.

Final mass balance sampling was conducted on 10 representative Porta-PSTA mesocosms on February 13, 14, and 15, 2001. This report documents the results from the Porta-PSTA mass balance study.

## 1.2 Project Objectives

This study had two primary objectives:

1. To quantify the ending mass of TP in the various potential storage media within a subset of the Porta-PSTAs
2. To support mass balance assessments previously based solely on input and output information.

Also of interest were the final masses of organic matter (biomass) and calcium (because of its association with P mineral storages) in the PSTA mesocosms.

## **Description of the Study Rationale and Site**

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## SECTION 2

# Description of the Study Site

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The Porta-PSTA mesocosms are located within the District's ENR project, as shown in Exhibit 2-1. The tanks are 1 x 6 meters in size (6 m<sup>2</sup> surface area) and 1 meter deep, and are constructed of fiberglass. For this study, the following 10 Porta-PSTAs were destructively sampled:

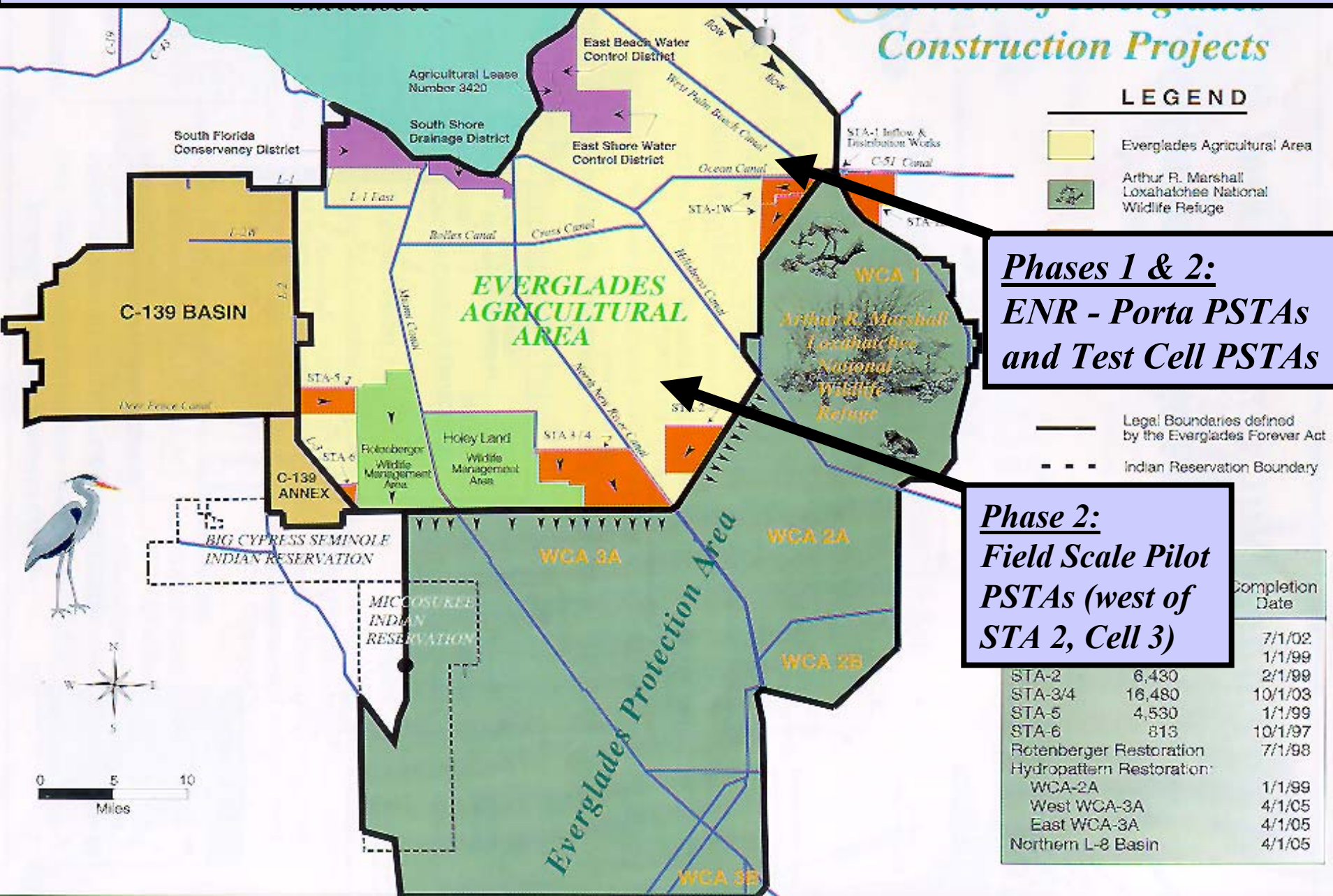
- Peat Treatment PP-3 (Tanks 12, 14, 17)
- Shellrock Treatment PP-4 (Tanks 3, 5, 10)
- Sand Control Treatments PP-7 and PP-17 (acid-washed) (Tanks 19, 20)
- No Substrate Control Treatments PP-18 and PP-19 (Tanks 21, 22)

The rationale for this selection was that treatments PP-3, PP-4, and PP-7 had been continuously operated with only a single operational change (water depth lowering) throughout the 18-month study period. These three treatments represent the most likely configuration envisioned for a full-scale PSTA (i.e., sparse macrophytes with periphyton growing on one or more of the following soils: peat, sand, or calcium-rich [limerock or shellrock]).

Treatment PP-17 was sampled for comparison to PP-7 and to have a second sand-based tank in the study, and treatments PP-18 and PP-19 were sampled as non-soil controls.

Treatments PP-17, PP-18, and PP-19 had only been operated during the Phase 2 period (approximately 6 months), while the other treatments had been operated nearly continuously for the full 18 months.

# PSTA Research & Demonstration Project Sites





# **Sampling Methods and Analytical Procedures**

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# Sampling Methods and Analytical Procedures

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## 3.1 Field Methods

Sampling methods were based on those specified in the *PSTA Research Plan* (CH2M HILL, April 2001) and further detailed in the *Porta-PSTA Mass Balance (Destructive) Sampling Plan* (CH2M HILL, February 2001).

Each of the following compartments in the 10 Porta-PSTAs were sampled as units:

- **Floating Periphyton Mat and Metaphyton:** All floating periphyton mat and metaphyton were removed from the 10 Porta-PSTAs with an aquarium net and by hand and then homogenized prior to analysis. The total volume of slurry was estimated and then subsampled for TP, total inorganic phosphorus (TIP), calcium (Ca), dry weight (DW), and ash-free dry weight (AFDW) analyses.
- **Wall Periphyton:** Periphyton was removed from the Porta-PSTA tank walls for estimation of the wet volume. After mixing, the periphyton was subsampled for TP, TIP, Ca, DW, and AFDW analyses. Periphyton wet volume was determined by gravity drainage of excess water and measurement in a volumetric cylinder.
- **Benthic Periphyton:** The benthic periphyton was removed from each of the 10 Porta-PSTAs by hand for estimation of wet volume. After homogenization, the periphyton was subsampled for TP, TIP, Ca, DW, and AFDW analyses.
- **End Wall Periphyton Taxonomy:** Samples of periphyton from the Porta-PSTA outflow endwalls were removed by scraping a known area of 0.0165 m<sup>2</sup>, the volume estimated and the sample submitted to the laboratory for taxonomic analysis (diatoms only). The purpose of this taxonomic analysis was to provide data for possible correlation to Porta-PSTA outflow TP concentrations.
- **Macrophyte Harvesting:** All macrophytes (including both submerged aquatic vegetation [SAV] and emergent plants) from the 10 Porta-PSTAs were removed and rinsed before determination of total wet weight. A subsample of this macrophyte biomass was divided into above- and belowground portions, which were then weighed wet to determine a root:shoot ratio. Subsamples from each macrophyte portion from each tank were submitted for analysis of TP, Ca, DW and AFDW.
- **Grazers (Snails, Fish, etc.):** All grazers observed in each of the 10 Porta-PSTAs were collected as a single sample for analysis from each tank. The consumers were analyzed for TP, Ca, DW, and AFDW.
- **Sediments:** Soils were collected at two depths (0- to 10-centimeter [cm] and 10- to 20-cm increments) using a small shovel and composited from a minimum of 10 locations within each of the 8 soil-based Porta-PSTAs. These composite samples were subsampled for estimates of bulk density, percent solids, TP, TIP, and Ca.

- **Macrophyte Stem Counts:** Emergent plant stems were counted and then divided into live and dead subgroups. Stems that were green above the water level were classified as live; stems that were predominantly brown above the water level were classified as dead.
- **Horizon Markers:** Feldspar horizon markers were originally placed in each of the substrate treatment Porta-PSTAs to quantify soil accumulation rate. Soils were cored at each of the horizon markers, and any soil over the horizon marker was to be measured and collected for analysis. None of the horizon markers in the Porta-PSTAs were evident at the time of final mass balance sampling.

In addition to the media listed above, inflow and outflow water was sampled on February 13, 2001, for all 24 of the Porta-PSTAs. Data from these samples were used to assess the TP in the surface water present in each tank at the time of sampling.

Except for soils and water, each compartment was completely sampled and homogenized, measured (wet weight and/or volume), and subsampled for gravimetric and chemical analyses. Two subsamples were analyzed for each of the three periphyton components (excludes endwall periphyton), for the macrophytes, and for each of the soil compartments. Grazers were entirely consumed in a single sample for analysis. Soil samples were composited from a minimum of 10 locations in each tank, and the composited samples were subsampled for analyses. A summary of the analytical parameters by matrix is provided in Exhibit 3-1.

#### EXHIBIT 3-1

Analytical Parameters for the Porta-PSTA Final Mass Balance Sampling

Media	Parameters and Number of Samples							
	No. of Cells	TP	TIP	Tax	Ca	DW	AFDW	Wet Bulk Density % Solids
Floating Periphyton/Metaphyton	10	X	X		X	X	X	
Consumers (snails, fish, etc.)	10	X	X		X	X	X	
Wall Periphyton	10	X	X		X	X	X	
Benthic Periphyton	10	X	X		X	X	X	
Endwall Periphyton	10			X				
Macrophytes- above Ground	8	X	X		X	X	X	
Macrophytes- below Ground	8	X	X		X	X	X	
Sediments (0–10 cm)	8	X	X		X			X X
(10–20 cm)	8	X	X		X			X X

## 3.2 Field and Analytical Team Members

CH2M HILL personnel collected the Porta-PSTA destructive samples in accordance with CH2M HILL's Comprehensive Quality Assurance Plan (CompQAP) No. 910036G. In



addition, Wetland Solutions, Inc., (WSI) personnel participated in sample collection in accordance with WSI's CompQAP No. (21003). District staff also participated in the efforts.

Analytical work was conducted by the following laboratories:

- University of Florida Institute of Food and Agricultural Sciences (IFAS) (CompQAP No. 910051) (all P analyses)
- PPB Laboratories (CompQAP No. 870017-19) (DW, AFDW, and calcium)
- Law Engineering (CompQAP No. 950024) (bulk densities)
- Water and Air Research (WAR) (CompQAP No. 900211-15) (diatom taxonomic analyses)

A detailed breakdown of parameters by laboratory and analytical methods can be reviewed in the *Porta-PSTA Mass Balance (Destructive) Sampling Plan* (CH2M HILL, February 2001).

### 3.3 Quality Control

All quality control (QC) protocols outline in the *Porta-PSTA Mass Balance (Destructive) Sampling Plan* (CH2M HILL, February 2001) were followed. These included:

- Field QC samples
- Sample management – sample labels, custody, and handling
- Field recordkeeping
- Data management

# Results

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## Results

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Detailed summary tables quantifying the total mass of TP, calcium, and carbon (organic matter) present in each sampled compartment for each of the Porta-PSTA treatments are presented in Appendix A. Field sheets and chain of custody forms are presented in Appendix B. Detailed lab reports from PPB (including Law Engineering results), IFAS, and WAR are provided in Appendices C, D, and E, respectively.

### 4.1 Water

Exhibit 4-1 summarizes the P water final mass balance results for each of the Porta-PSTA treatments monitored during destructive sampling. Inflow water quality samples were collected from the Porta-PSTA head tank and resulted in an average TP inflow concentration of 0.020 grams per cubic meter ( $\text{g}/\text{m}^3$ ) (equivalent to milligrams per liter [ $\text{mg}/\text{L}$ ]). Average Porta-PSTA TP outflow concentrations ranged from 0.011  $\text{g}/\text{m}^3$  to 0.021  $\text{g}/\text{m}^3$ , with Porta-PSTA treatments PP-3 (Peat) and PP-17 (Sand) having the higher TP concentrations. PP-3 also exhibited a higher average total particulate phosphorus (TPP) concentration (0.013  $\text{g}/\text{m}^3$ ) compared to the other treatments sampled (0.002 to 0.007  $\text{g}/\text{m}^3$ ). Water total mass amounts were estimated based on outflow concentration alone, assuming a relatively well mixed hydraulic condition in the tanks.

### 4.2 Periphyton

Exhibit 4-2 summarizes the average mass of TP, calcium, and biomass in the periphyton compartment for each Porta-PSTA treatment at the time of sampling.

Exhibit 4-3 illustrates the total mass of periphyton TP and the percentage found in each compartment for each of the treatments. The benthic mat generally had the highest average mass of TP, compared to the floating mat/metaphyton and wall mat. The benthic mat TP ranged from 68.7  $\text{mg P}/\text{m}^2$  in the peat treatment (PP-3) to 558  $\text{mg P}/\text{m}^2$  in the sand treatment (PP-7). The total average periphyton TP varied from 95  $\text{mg P}/\text{m}^2$  in the peat treatment to 626  $\text{mg P}/\text{m}^2$  in the sand treatment. The average periphyton TP in the floating mat/metaphyton and wall mat component did not fluctuate between treatments as much as the benthic mat samples. The floating mat/metaphyton samples varied from 17.5  $\text{mg P}/\text{m}^2$  in the peat treatment to 86.1  $\text{mg P}/\text{m}^2$  in the Aquamat treatment (PP-19). The acid-rinsed sand treatment (PP-17) had the lowest wall mat TP value (2.3  $\text{mg P}/\text{m}^2$ ), while the shellrock treatment (PP-4) averaged 35.3  $\text{mg P}/\text{m}^2$ .

Exhibit 4-4 illustrates the average calcium content in periphyton samples and the percentage found in each compartment for each of the treatments. The benthic mat generally had the highest average calcium values, compared to the floating mat/metaphyton and wall mat.



**EXHIBIT 4-1**  
Porta-PSTA Water Final Mass Balance Sampling, February 2001

Soil Type Water Depth (m)	Treatment No.					
	PP-3 Peat 0.31	PP-4 Shellrock 0.37	PP-7 Sand 0.37	PP-17 Sand 0.33	PP-18 None 0.31	PP-19 Aquamat 0.33
<b>Inflow Water (g/m<sup>3</sup>)</b>						
TP	0.020	0.020	0.020	0.020	0.020	0.020
TDP	0.009	0.009	0.009	0.009	0.009	0.009
DRP	0.006	0.006	0.006	0.006	0.006	0.006
DOP	0.004	0.004	0.004	0.004	0.004	0.004
TPP	0.010	0.010	0.010	0.010	0.010	0.010
<b>Outflow Water (g/m<sup>3</sup>)</b>						
TP	0.021	0.011	0.011	0.021	0.011	0.011
TDP	0.008	0.007	0.007	0.014	0.009	0.007
DRP	0.003	0.003	0.001	0.003	0.003	0.001
DOP	0.005	0.004	0.006	0.011	0.006	0.006
TPP	0.013	0.004	0.004	0.007	0.002	0.004
<b>Phosphorus (mg/m<sup>2</sup>)<sup>a</sup></b>						
TP	6.05	4.10	4.03	6.88	3.44	3.59
TDP	2.33	2.61	2.56	4.58	2.82	2.29
DRP	0.95	1.00	0.37	0.98	0.94	0.33
DOP	1.38	1.62	2.20	3.60	1.88	1.96
TPP	3.72	1.49	1.46	2.29	0.63	1.31

Notes:

<sup>a</sup>Phosphorus in water column based on outflow concentration only.

TP = total phosphorus

TDP = total dissolved phosphorus

DRP = dissolved reactive phosphorus

DOP = dissolved organic phosphorus

TPP = total particulate phosphorus

**Exhibit 4-2**

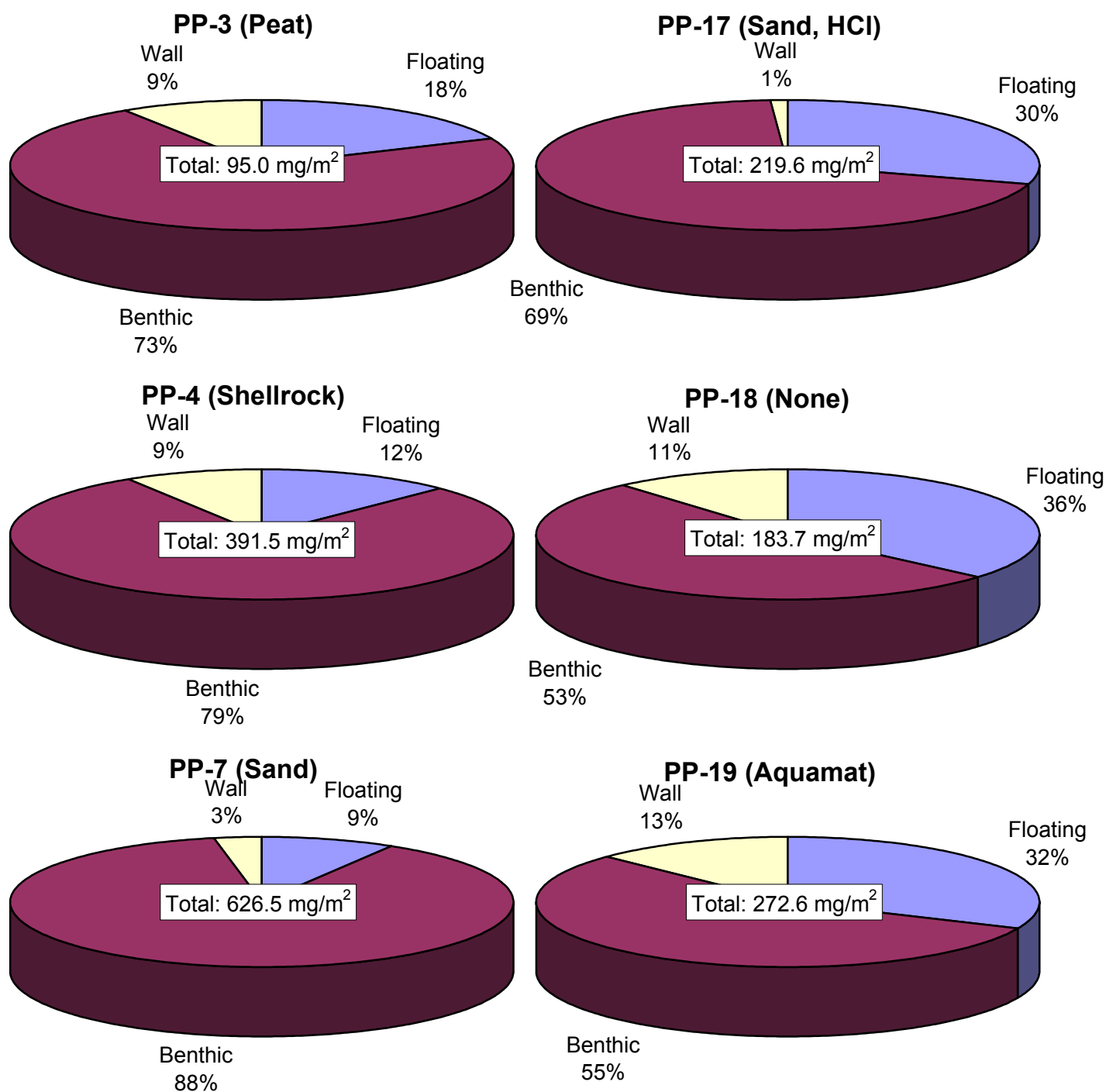
Porta-PSTA Periphyton Final Mass Balance Sampling, February 2001

<b>Treatment No.</b>	<b>PP-3</b>	<b>PP-4</b>	<b>PP-7</b>	<b>PP-17</b>	<b>PP-18</b>	<b>PP-19</b>
<b>Soil Type</b>	<b>Peat</b>	<b>Shellrock</b>	<b>Sand</b>	<b>Sand</b>	<b>None</b>	<b>AquaMat</b>
<b>Tank Bottom Area (m<sup>2</sup>)</b>	<b>6</b>	<b>6</b>	<b>6</b>	<b>6</b>	<b>6</b>	<b>6</b>
<b>Dry Weight (g/m<sup>2</sup>)</b>						
Floating Mat/Metaphyton	25.2	158.2	238.8	229.9	386.0	482.5
Benthic Mat	92.4	552.4	1814.3	810.2	622.0	534.6
Wall Mat	17.2	185.4	116.4	3.3	137.4	203.0
Total	134.8	896.0	2169.5	1043.4	1145.5	1220.0
<b>Wet Weight (g/m<sup>2</sup>)</b>						
Floating Mat/Metaphyton	535	3,121	2,835	3,250	5,443	7,408
Benthic Mat	1,473	6,312	13,155	7,485	10,205	8,997
Wall Mat	190	2,427	1,058	378	2,248	4,083
Total	2,197	11,861	17,048	11,113	17,897	20,488
<b>Ash-Free Dry Weight (g/m<sup>2</sup>)</b>						
Floating Mat/Metaphyton	13.0	40.0	58.8	54.6	99.4	126.8
Benthic Mat	58.3	121.7	167.5	121.2	160.7	129.4
Wall Mat	6.7	52.9	23.1	1.2	35.6	52.6
Total	78.0	214.7	249.4	177.0	295.7	308.7
<b>Ash Weight (g/m<sup>2</sup>)</b>						
Floating Mat/Metaphyton	12.2	118.2	180.1	175.3	286.7	355.7
Benthic Mat	34.1	430.6	1645.5	688.4	461.3	383.4
Wall Mat	10.5	132.5	93.2	19.0	101.9	150.4
Total	56.7	681.3	1918.9	882.8	849.8	889.4
<b>Total Phosphorus (mg/m<sup>2</sup>)</b>						
Floating Mat/Metaphyton	17.5	48.8	53.4	65.0	66.8	86.1
Benthic Mat	68.7	307.4	554.7	152.3	96.0	151.5
Wall Mat	8.8	35.3	18.3	2.3	21.0	35.1
Total	95.0	391.5	626.5	219.6	183.7	272.6
<b>Total Phosphorus (mg/kg)</b>						
Floating Mat/Metaphyton	564	296	225	283	173	178
Benthic Mat	738	558	307	185	284	283
Wall Mat	496	219	157	678	153	173
Average	561	435	289	210	230	223
<b>TIP (mg/m<sup>2</sup>)</b>						
Floating Mat/Metaphyton	2.71	20.43	7.38	10.38	17.17	31.06
Benthic Mat	11.94	131.45	36.16	32.42	28.55	48.70
Wall Mat	1.27	12.95	2.33	0.22	2.98	8.36
Total	15.92	164.84	45.87	43.01	48.71	88.13
<b>TIP (mg/kg)</b>						
Floating Mat/Metaphyton	78.81	121.45	31.67	45.09	44.51	64.44
Benthic Mat	128.41	238.51	19.82	40.74	45.60	91.13
Wall Mat	80.47	74.40	20.40	84.01	21.66	42.05
Average	94.05	179.85	21.14	41.23	42.52	72.23
<b>Calcium (g/m<sup>2</sup>)</b>						
Floating Mat/Metaphyton	4.2	40.4	44.7	43.6	89.7	108.3
Benthic Mat	7.3	99.7	167.7	72.5	145.7	136.5
Wall Mat	3.6	62.7	23.3	0.6	33.2	50.6
Total	15.1	202.9	235.8	116.8	268.5	295.4
<b>Calcium (mg/kg)</b>						
Floating Mat/Metaphyton	199818	250882	207921	189564	232154	224525
Benthic Mat	78291	181129	91916	90587	235844	255084
Wall Mat	210292	326136	217385	195045	241271	249609
Total	151798	218420	108669	111911	234435	242109

Note:

Number of replicates: PP-3 (3), PP-4 (3), PP-7 (1), PP-17 (1), PP-18 (1), PP-19 (1)

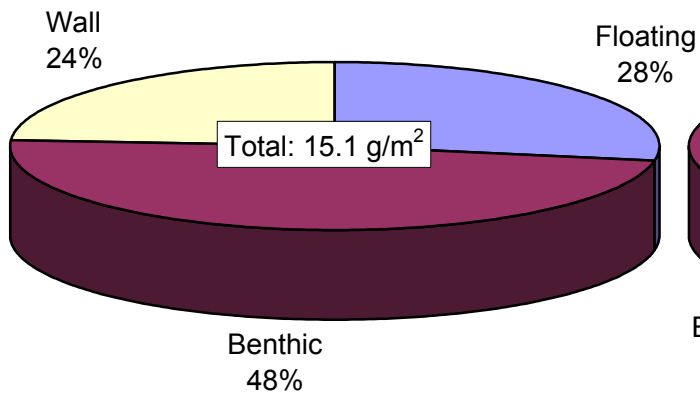
TIP = total inorganic phosphorus



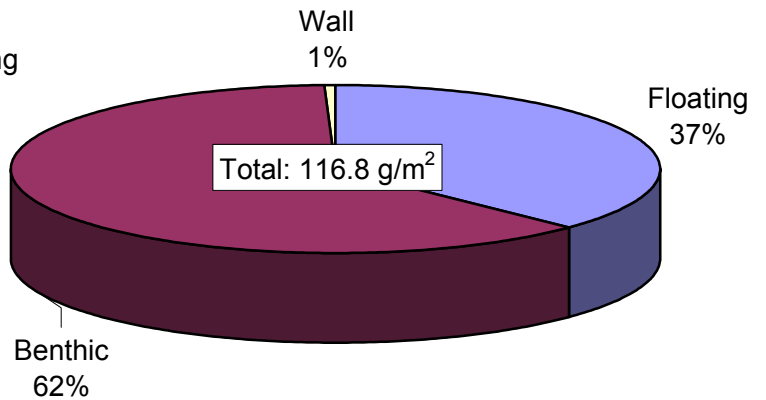
#### Exhibit 4-3

TP Content for each Periphyton Compartment for the Porta-PSTA Treatments

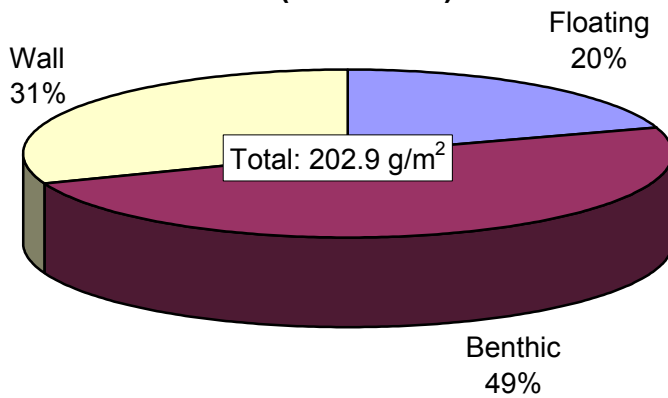
**PP-3 (Peat)**



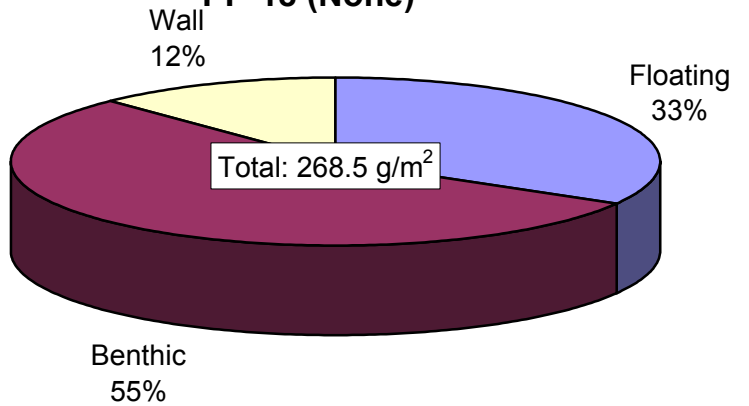
**PP-17 (Sand, HCl)**



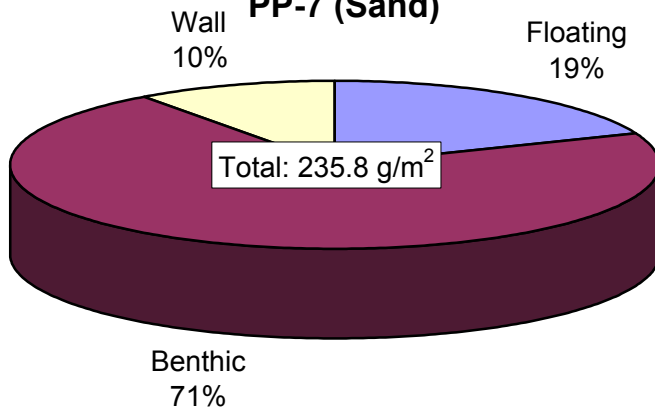
**PP-4 (Shellrock)**



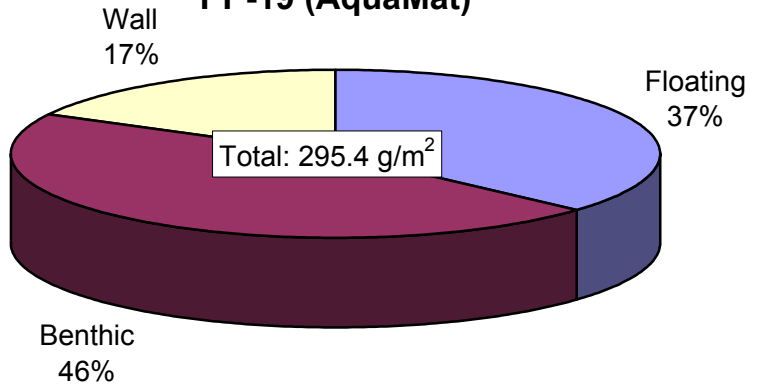
**PP-18 (None)**



**PP-7 (Sand)**



**PP-19 (AquaMat)**



**Exhibit 4-4**

Calcium Content for each Periphyton Compartment for the Porta-PSTA Treatments



The benthic mat calcium varied from 7.3 g Ca/m<sup>2</sup> in the peat treatment to 168 g Ca/m<sup>2</sup> in the sand treatment. The Aquamat treatment had the highest estimated total average periphyton calcium content (295 mg Ca/m<sup>2</sup>), while the peat treatment averaged 15.1 g Ca/m<sup>2</sup>. The Aquamat treatment also displayed the highest average calcium content in its floating mat samples (108 g Ca/m<sup>2</sup>) compared to the other treatments.

Exhibit 4-5 illustrates the periphyton AFDW biomass and the percentage found in each compartment for each of the treatments. With the exception of the Aquamat treatment, the benthic mat generally had the highest average AFDW biomass, compared to the floating mat/metaphyton and wall mat. The benthic mat AFDW biomass varied from 58.3 g AFDW/m<sup>2</sup> in the peat treatment to 168 g AFDW/m<sup>2</sup> in the sand treatment. There was no difference between the average AFDW biomass for the benthic mat (129 g AFDW/m<sup>2</sup>) and floating mat (129 g AFDW/m<sup>2</sup>) in the Aquamat treatment. The total periphyton AFDW biomass varied from 78.0 g Ca/m<sup>2</sup> in the peat treatment to 309 g Ca/m<sup>2</sup> in the Aquamat treatment. The Aquamat treatment had the highest floating mat/metaphyton AFDW biomass (127 mg AFDW/m<sup>2</sup>), while the peat treatment averaged 13.0 g AFDW/m<sup>2</sup>. The wall mat samples varied from 1.2 g AFDW/m<sup>2</sup> in the acid-rinsed sand treatment to 52.9 g AFDW/m<sup>2</sup> in the shellrock treatment.

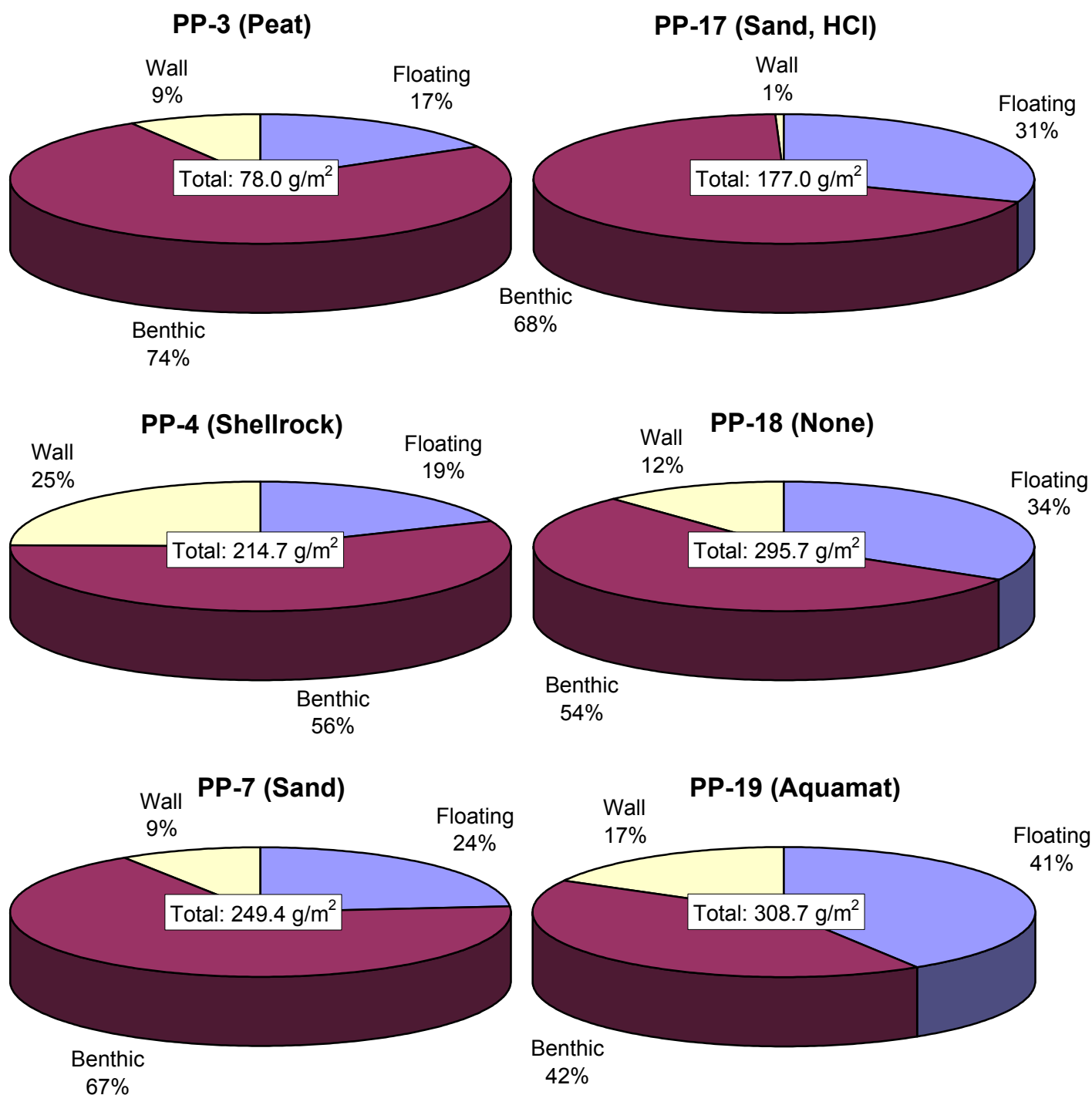
### 4.3 Macrophytes

Exhibit 4-6 summarizes the average mass of TP, calcium, and biomass present in the macrophyte compartment for each Porta-PSTA treatment with macrophytes at the time of sampling.

Exhibit 4-7 illustrates the total mass of macrophyte TP and the percentage found in the aboveground and belowground portions for each of the treatments. There were no significant TP mass differences between the aboveground and belowground portions for each treatment. The peat and shellrock treatments (PP-3 at 320 mg P/m<sup>2</sup>, and PP-4 at 231 mg P/m<sup>2</sup>, respectively) displayed higher total macrophyte TP mass than the sand treatments (PP-7 at 195 mg P/m<sup>2</sup>, and PP-17 at 180 mg P/m<sup>2</sup>).

Exhibit 4-8 illustrates the average calcium content in macrophyte samples and the percentage found in the aboveground and belowground portions for each of the treatments. The aboveground portion displayed higher calcium values for all treatments except the shellrock treatment, which had higher levels in the belowground portion. The shellrock treatment also exhibited the highest total calcium content for the total macrophyte sample (11 g Ca/m<sup>2</sup>).

Exhibit 4-9 illustrates the macrophyte AFDW biomass and the percentage found in the aboveground and belowground portions of each treatment. The aboveground portion displayed higher average AFDW biomass, compared to the belowground portion for each treatment. The total AFDW biomass (aboveground and belowground) varied from 183 g AFDW/m<sup>2</sup> in the acid-rinsed sand treatment to 614 g AFDW/m<sup>2</sup> in the peat treatment.



#### Exhibit 4-5

Ash-Free Dry Weight Biomass for each Periphyton Compartment for the Porta-PSTA Treatments

**Exhibit 4-6**

Porta-PSTA Macrophyte Final Mass Balance Sampling, February 2001

<b>Treatment No.</b>	<b>PP-3</b>	<b>PP-4</b>	<b>PP-7</b>	<b>PP-17</b>
<b>Soil Type</b>	<b>Peat</b>	<b>Shellrock</b>	<b>Sand</b>	<b>Sand</b>
<b>Tank Bottom Area (m<sup>2</sup>)</b>	<b>6</b>	<b>6</b>	<b>6</b>	<b>6</b>
<b>Total Phosphorus (mg/m<sup>2</sup>)</b>				
Aboveground	178.6	135.2	87.9	88.4
Belowground	141.0	95.3	106.8	91.9
Total	319.7	230.5	194.7	180.3
<b>Total Phosphorus (mg/kg)</b>				
Aboveground	335.3	558.0	509.6	586.5
Belowground	876.0	976.9	1,333.6	1,277.5
Average	605.7	767.4	921.6	932.0
<b>Wet Weight (g/m<sup>2</sup>)</b>				
Aboveground	3,315.6	1,582.0	829.6	626.6
Belowground	1,365.2	737.0	663.7	476.8
Total	4,691.0	2,317.2	1,493.3	1,103.3
<b>Dry Weight (g/m<sup>2</sup>)</b>				
Aboveground	526.1	277.4	173.1	153.1
Belowground	161.9	103.6	79.8	71.8
Total	688.0	381.0	252.9	224.9
<b>Ash-Free Dry Weight (g/m<sup>2</sup>)</b>				
Aboveground	470.6	240.8	152.6	123.9
Belowground	143.6	63.6	70.0	59.2
Total	614.3	304.4	222.7	183.1
<b>Ash-Weight (g/m<sup>2</sup>)</b>				
Aboveground	55.4	36.6	20.4	29.2
Belowground	18.3	40.0	9.8	12.6
Total	73.7	76.7	30.2	41.8
<b>Calcium (g/m<sup>2</sup>)</b>				
Aboveground	3.48	4.49	0.94	1.65
Belowground	1.32	6.52	0.45	0.54
Total	4.80	11.01	1.39	2.20
<b>Calcium (mg/kg)</b>				
Aboveground	6,730	17,190	5,425	11,025
Belowground	7,448	60,300	5,600	7,560
Average	7,119	30,602	5,500	9,767
<b>Stem Counts (#/m<sup>2</sup>)</b>				
Live	158	89	---	---
Dead	364	119	---	---
Total	522	208	---	---

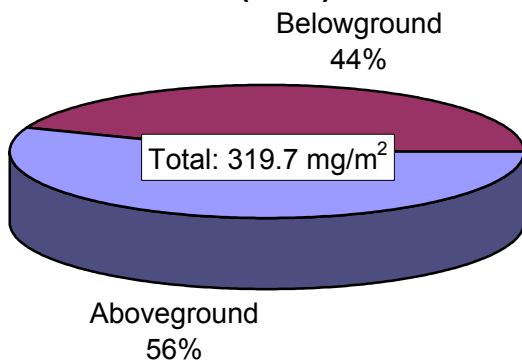
Notes:

Number of replicates: PP-3 (3), PP-4 (3), PP-7 (1), PP-17 (1)

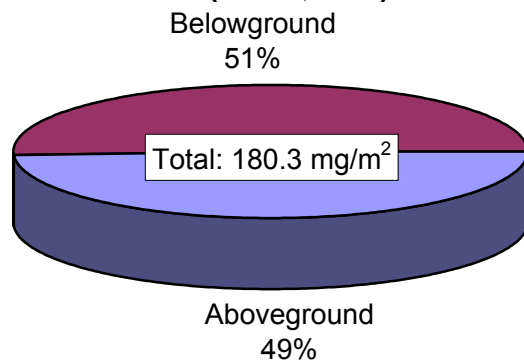
-- = not sampled

Stem counts made only in emergent vegetation.

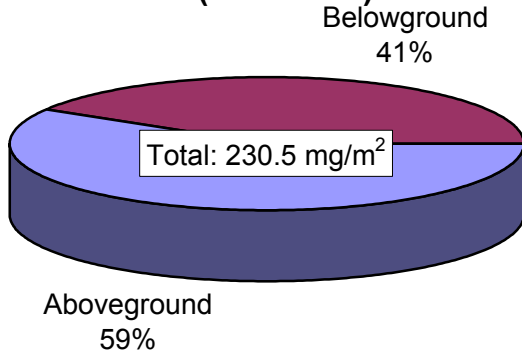
**PP-3 (Peat)**



**PP-17 (Sand, HCl)**



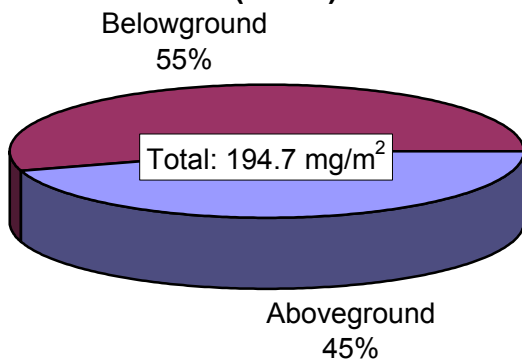
**PP-4 (Shellrock)**



**PP-18 (None)**

No Macrophytes

**PP-7 (Sand)**



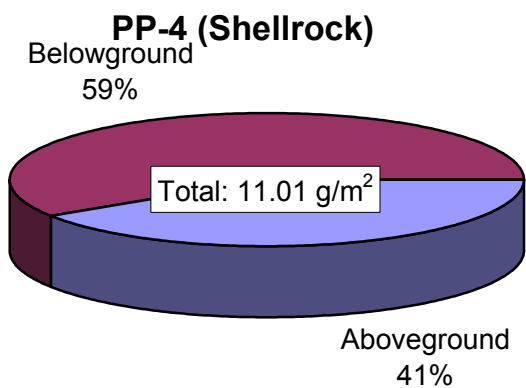
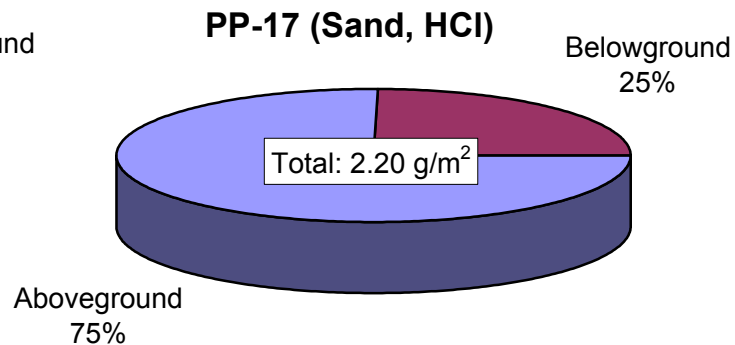
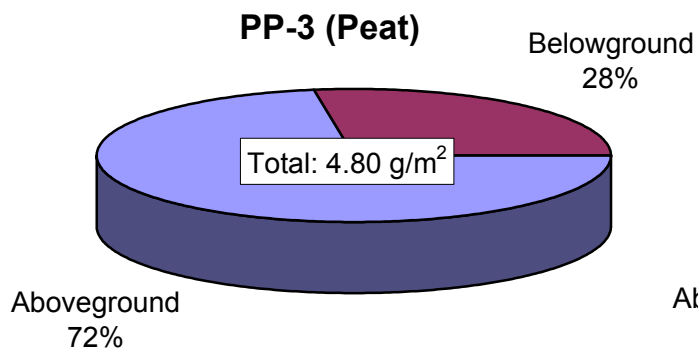
**PP-19 (Aquamat)**

No Macrophytes

**Exhibit 4-7**

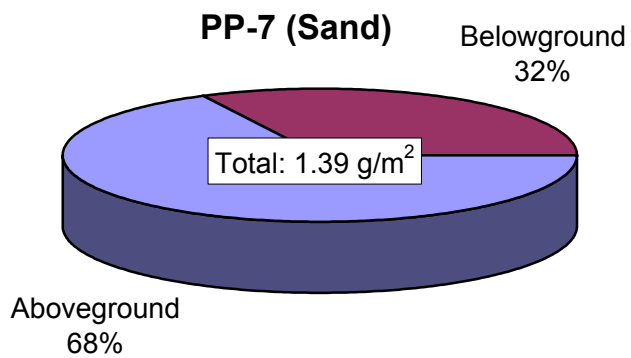
TP Content for each Macrophyte Compartment for the Porta-PSTA Treatments





**PP-18 (None)**

No Macrophytes



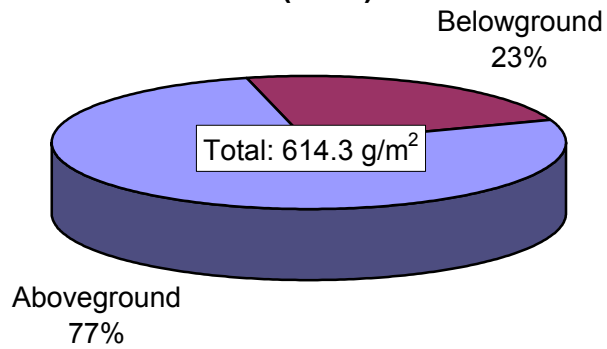
**PP-19 (Aquamat)**

No Macrophytes

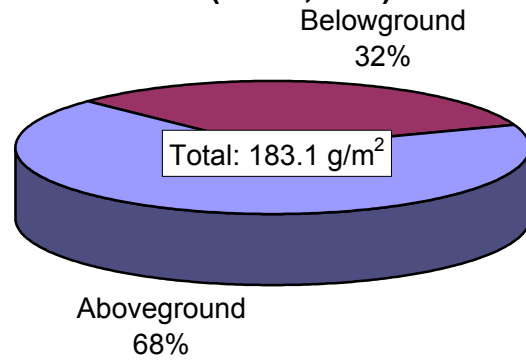
**Exhibit 4-8**

Calcium Content for each Macrophyte Compartment for the Porta-PSTA Treatments

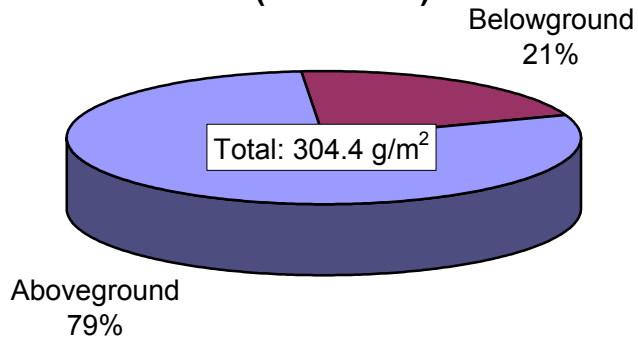
**PP-3 (Peat)**



**PP-17 (Sand, HCl)**



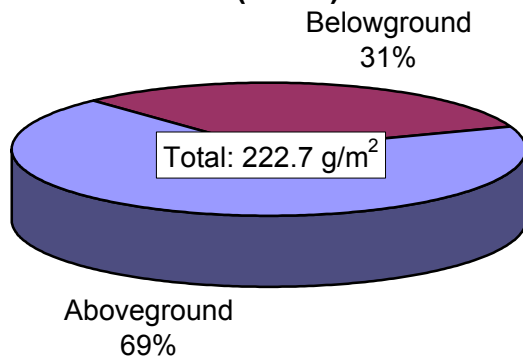
**PP-4 (Shellrock)**



**PP-18 (None)**

No Macrophytes

**PP-7 (Sand)**



**PP-19 (Aquamat)**

No Macrophytes

**Exhibit 4-9**

Ash-Free Dry Weight Biomass for each Macrophyte Compartment for the Porta-PSTA Treatments

## 4.4 Consumers

Exhibits 4-10 and 4-11 summarize the average mass of TP, calcium, and carbon present in the consumers collected from each of the Porta-PSTAs at the time of sampling. Consumers collected from the Aquamat treatment had higher mass of TP, calcium, and AFDW biomass compared to the other treatments. Average consumer TP estimates from all treatments varied from 0.01 mg P/m<sup>2</sup> in the acid-rinsed sand treatment (PP-17) to 9.07 mg P/m<sup>2</sup> in the Aquamat treatment (PP-19). The acid-rinsed sand treatment also had the lowest consumer calcium content and AFDW biomass estimate (0.008 g Ca/m<sup>2</sup> and 0.02 g AFDW/m<sup>2</sup>, respectively) in comparison with the other treatments. The Aquamat treatment had the highest consumer calcium content and AFDW biomass estimate (1.03 g Ca/m<sup>2</sup> and 2.01 g AFDW/m<sup>2</sup>, respectively).

### EXHIBIT 4-10

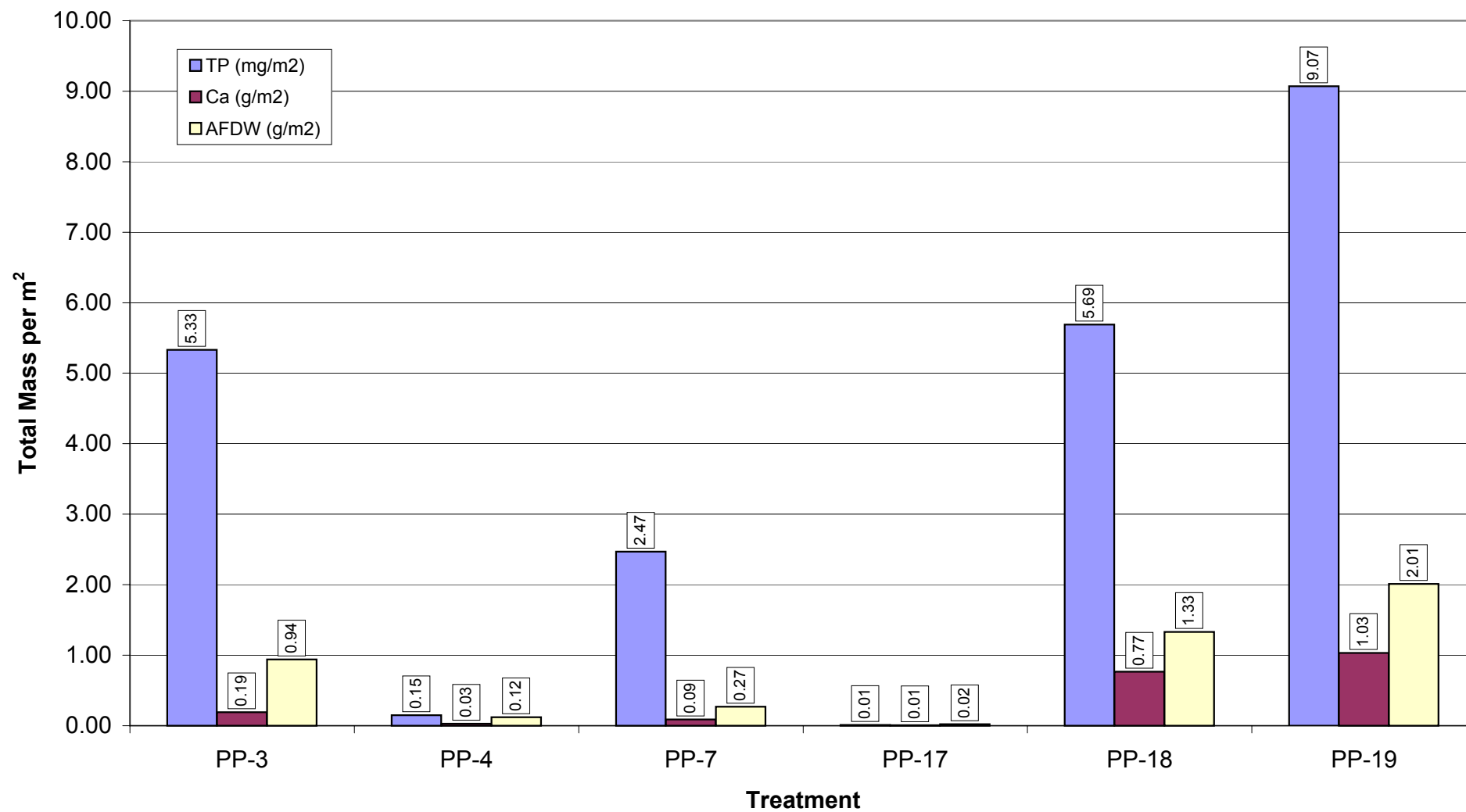
Porta-PSTA Consumer Final Mass Balance Sampling, February 2001

Soil Type Tank Bottom Area (m <sup>2</sup> )	Treatment No.					
	PP-3 Peat 6	PP-4 Shellrock 6	PP-7 Sand 6	PP-17 Sand 6	PP-18 None 6	PP-19 Aquamat 6
Total Phosphorus (mg/m <sup>2</sup> )	5.33	0.15	2.47	0.01	5.69	9.07
Total Phosphorus (mg/kg)	2402.1	570.7	4066.7	160.6	1466.3	2714.5
Calcium (g/m <sup>2</sup> )	0.19	0.03	0.089	0.008	0.767	1.031
Calcium (mg/kg)	112595	90320	146336	175425	197518	308686
Wet Weight (g/m <sup>2</sup> )	22.50	12.39	15.50	6.50	24.83	26.50
Dry Weight (g/m <sup>2</sup> )	1.18	0.30	0.61	0.04	3.88	3.34
Ash Weight (g/m <sup>2</sup> )	0.24	0.19	0.34	0.02	2.55	1.33
Ash-Free Dry Weight (g/m <sup>2</sup> )	0.94	0.12	0.27	0.02	1.33	2.01

## 4.5 Sediments

Exhibit 4-12 summarizes the average mass of TP, calcium, percent solids, and bulk density in the upper soil layer (0 to 10 cm) and lower soil layer (10 to 20 cm) for each Porta-PSTA at the time of sampling.

Exhibit 4-13 illustrates the total mass of soil TP and the percentage found in the upper and lower layers for each of the treatments. There was generally little difference in soil TP content between the two layers for each treatment. The peat treatment (PP-3) had slightly higher TP levels in the lower soil layer (5,572 mg P/m<sup>2</sup>) than in the surface layer (3,887 mg P/m<sup>2</sup>). The shellrock treatment (PP-4) had a higher total soil TP (270,701 mg P/m<sup>2</sup>) than in the peat (9,460 mg P/m<sup>2</sup>), and sand treatments (PP-7 at 5,625 mg P/m<sup>2</sup> and PP-17 5,675 mg P/m<sup>2</sup>).



#### Exhibit 4-11

Total Mass of TP, Calcium, and Ash-Free Dry Weight Biomass Estimated in Consumers Collected from Porta-PSTA Mesocosms

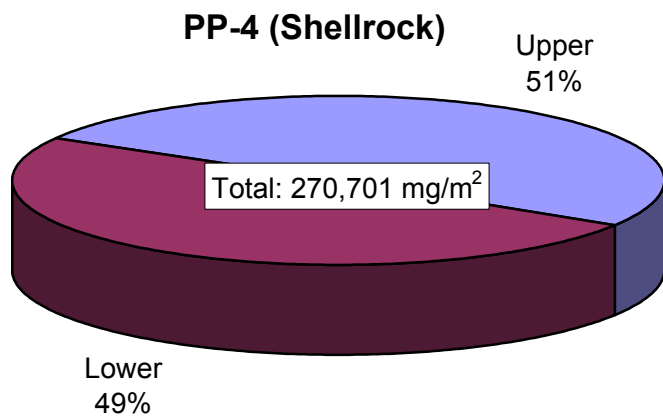
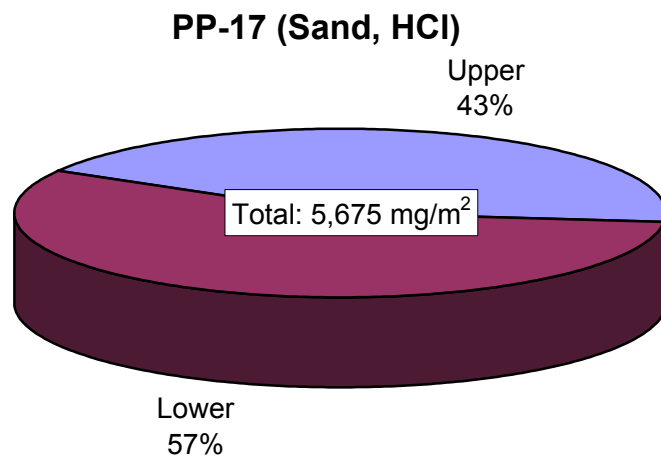
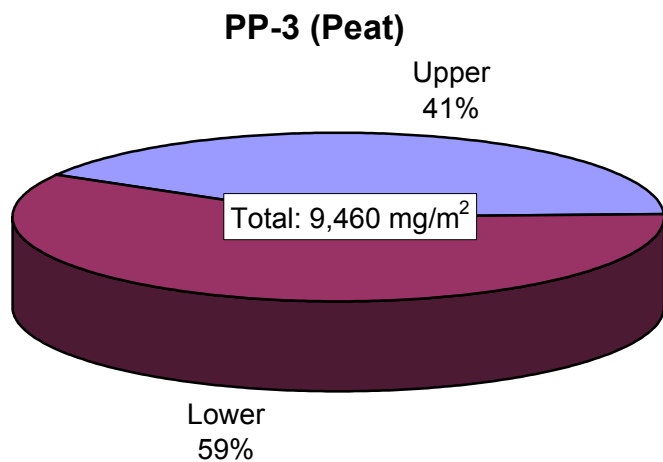


**Exhibit 4-12**

Porta-PSTA Soil Final Mass Balance Sampling, February 2001

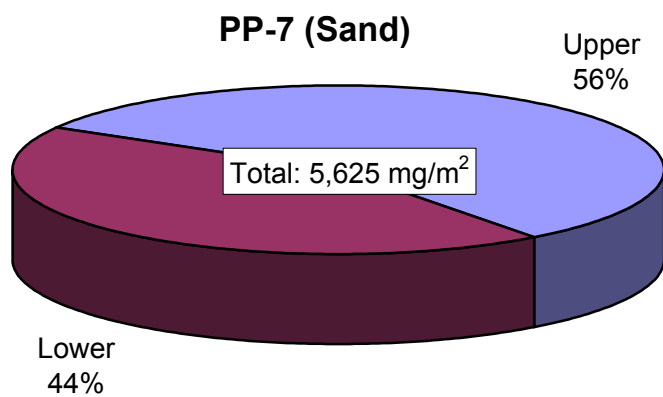
<b>Treatment No.</b>	<b>PP-3</b>	<b>PP-4</b>	<b>PP-7</b>	<b>PP-17</b>
<b>Soil Type</b>	<b>Peat</b>	<b>Shellrock</b>	<b>Sand</b>	<b>Sand</b>
<b>Tank Bottom Area (m<sup>2</sup>)</b>	<b>6</b>	<b>6</b>	<b>6</b>	<b>6</b>
<b>Total Phosphorus (mg/m<sup>2</sup>)</b>				
Upper (0-10 cm)	3,887	137,195	3,176	2,463
Lower (10-20 cm)	5,572	133,506	2,450	3,212
Total	9,460	270,701	5,625	5,675
<b>Total Phosphorus (mg/kg)</b>				
Upper (0-10 cm)	122.13	996.10	23.88	18.41
Lower (10-20 cm)	135.80	925.17	16.28	20.34
Average (0-20 cm)	128.97	960.63	20.08	19.37
<b>TIP (mg/m<sup>2</sup>)</b>				
Upper (0-10 cm)	3,244	128,592	1,384	1,361
Lower (10-20 cm)	3,926	127,306	1,356	1,086
Total	7,170	255,899	2,740	2,447
<b>TIP (mg/kg)</b>				
Upper (0-10 cm)	93.70	970.54	10.48	9.79
Lower (10-20 cm)	94.83	905.41	9.17	6.83
Average (0-20 cm)	94.26	937.97	9.83	8.31
<b>Calcium (g/m<sup>2</sup>)</b>				
Upper (0-10 cm)	4,028	19,879	744	83
Lower (10-20 cm)	4,702	23,784	90	133
Total	8,730	43,663	834	216
<b>Calcium (mg/kg)</b>				
Upper (0-10 cm)	130,465	143,833	5,595	624
Lower (10-20 cm)	114,600	163,833	597	844
Average (0-20 cm)	122,533	153,833	3,096	734
<b>Percent Solids</b>				
Upper (0-10 cm)	28.32	68.83	73.45	83.20
Lower (10-20 cm)	28.22	79.00	80.90	80.20
Average (0-20 cm)	28.27	73.92	77.18	81.70
<b>Dry Bulk Density (g/cm<sup>3</sup>)</b>				
Upper (0-10 cm)	0.32	1.38	1.33	1.34
Lower (10-20 cm)	0.41	1.45	1.51	1.58
Average (0-20 cm)	0.36	1.41	1.42	1.46

Number of replicates: PP-3 (3), PP-4 (3), PP-7 (1), PP-17 (1)



**PP-18 (None)**

No Soil



**PP-19 (Aquamat)**

No Soil

**Exhibit 4-13**

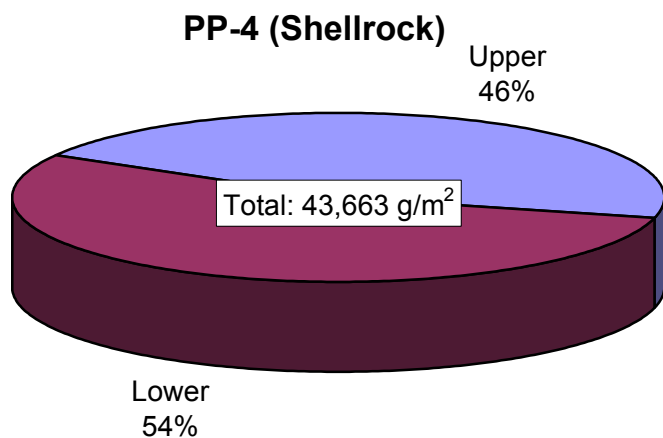
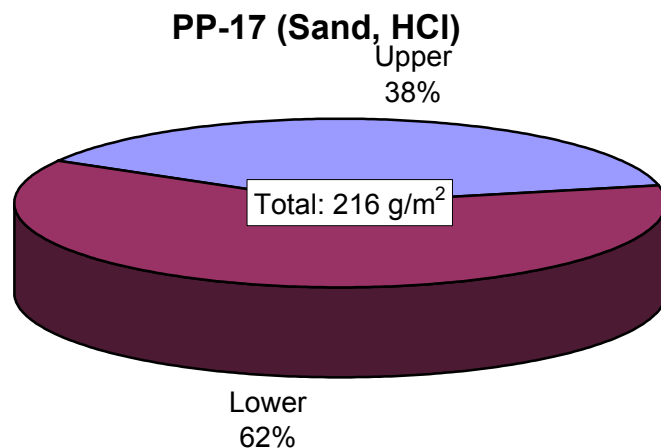
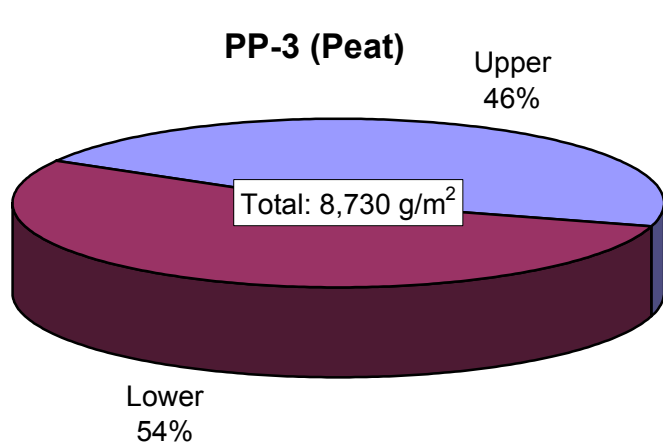
Total Phosphorus Content from the Upper (0-10 cm) and Lower (10-20 cm) Soil Layers in the Porta-PSTA Treatments

Exhibit 4-14 displays the average total calcium content and the percentage found in the upper and lower soil layers sampled in each of the treatments. The calcium content was estimated at relatively equal proportions in the upper and lower layers for both the peat and shellrock treatments, with the highest total soil calcium from the shellrock treatment (PP-4 at 43,663 g Ca/m<sup>2</sup>). The acid-rinsed sand treatment had higher calcium levels in the lower level (62 percent of total), with the lowest total soil calcium level (216 g Ca/m<sup>2</sup>) of all measured treatments. The “non-rinsed” sand treatment had higher calcium levels in the upper soil layer (89 percent of total), with total calcium content in both layers of 834 g Ca/m<sup>2</sup>.

Exhibit 4-15 illustrates the average soil bulk density for each treatment by soil layer. There was no apparent difference between the upper and lower soil bulk densities for each of the treatments sampled. The average bulk density for the peat treatment was the lowest at 0.36 g/cm<sup>3</sup>, while the shellrock and sand treatments (“non-rinsed” and acid-rinsed) were generally the same, with average bulk densities of 1.41, 1.42, and 1.46 g/cm<sup>3</sup> for PP-4, PP-7, and PP-17, respectively.

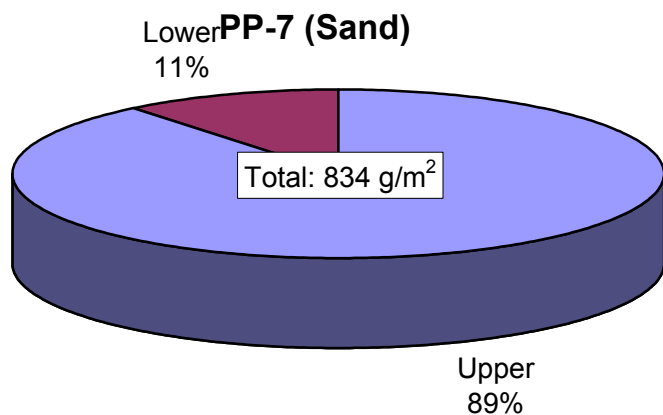
## 4.6 Endwall Diatom Taxonomy

Exhibits 4-16 and 4-17 display a summary of diatom (phylum: Bacillariophyceae) occurrence and density, respectively, on the Porta-PSTA tank downstream endwalls at the time of sampling. The most common species observed within all sampled treatments were *Mastogloia* spp., *Fragilaria* spp., and *Achnanthes* spp. The average diatom density was greatest in the shellrock treatments, with tank 3 having the highest density (366,556 cells/cm<sup>2</sup> of sampled wall area), followed by the sand treatment (PP-7 at 128,685 cells/cm<sup>2</sup>). The lowest average density was observed in the peat treatments, with tank 12 having the lowest density (2,990 cells/cm<sup>2</sup>).



**PP-18 (None)**

No Soil



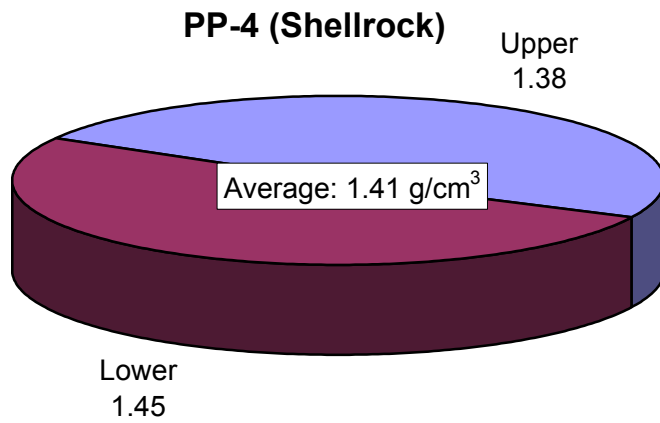
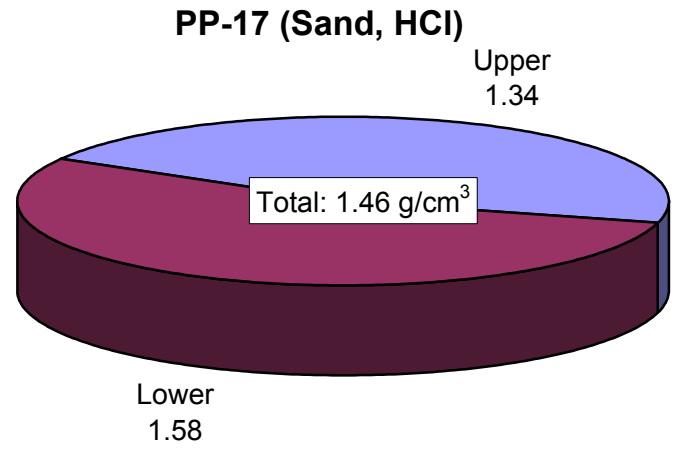
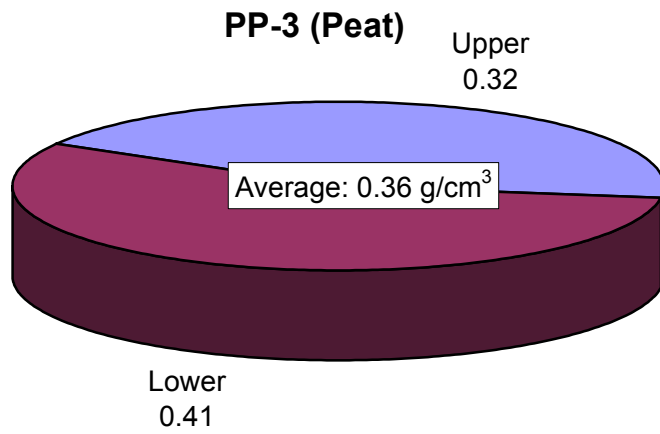
**PP-19 (Aquamat)**

No Soil

**Exhibit 4-14**

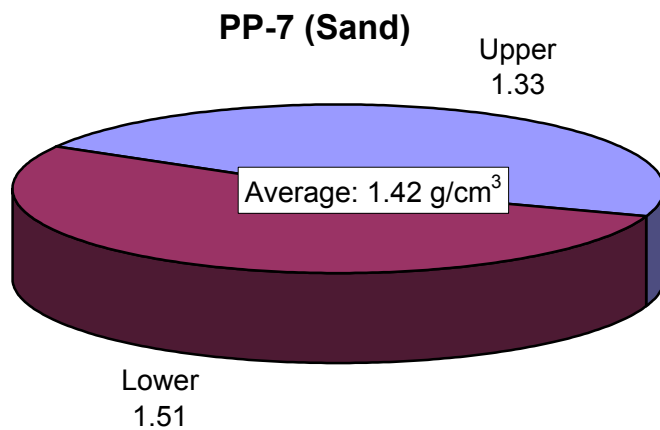
Calcium Content from the Upper (0–10 cm) and Lower (10–20 cm) Soil Layers in the Porta-PSTA Treatments





**PP-18 (None)**

No Soil



**PP-19 (Aquamat)**

No Soil

**Exhibit 4-15**

Bulk Density (g/cm<sup>3</sup>) for the Upper (0–10 cm) and Lower (10–20 cm) Soil Layers in the Porta-PSTA Treatments

Exhibit 4-16

Diatom Occurrence on Porta-PSTA Downstream Endwalls, February 2001

Treatment Number Tank Number	Number of Species Included	PP-3			PP-4			PP-7	PP-17	PP-18	PP-19
		12	14	17	3	5	10	19	20	21	22
<i>Achnanthes</i> spp.	2	62.2	28.0	39.7	2.0	11.8	6.5	4.1	34.0	0.0	2.9
<i>Amphipleura</i> , spp.	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0
<i>Brachysira</i> , spp.	2	1.4	0.8	2.8	9.4	3.3	4.0	0.5	0.0	0.4	0.8
<i>Cyclotella</i> , spp.	1	1.4	0.4	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0
<i>Cymbella</i> , spp.	2	5.5	12.1	4.9	14.2	18.3	5.1	13.6	11.9	11.6	5.5
<i>Diploneis</i> , spp.	2	1.4	1.2	0.7	0.8	1.2	0.4	0.2	0.0	0.2	0.2
<i>Encyonema</i> , spp.	6	6.8	4.7	4.2	19.8	49.2	10.1	11.1	15.3	14.7	9.2
<i>Eunotia</i> , spp.	2	1.4	3.9	0.7	0.4	0.8	2.0	0.0	0.0	0.0	0.0
<i>Fragilaria</i> , spp.	4	0.0	18.7	26.2	18.2	7.3	28.9	20.2	20.8	13.9	35.7
<i>Gomphonema</i> , spp.	4	5.5	3.5	2.1	1.2	0.4	1.2	0.4	2.0	0.6	2.0
<i>Gyrosigma</i> s, spp.	1	<0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Mastogloia</i> , spp.	3	6.8	9.3	11.3	29.8	3.9	24.3	46.8	2.5	49.0	34.4
<i>Navicula</i> , spp.	4	0.0	4.7	0.0	0.6	0.6	0.0	0.5	3.7	2.4	0.8
<i>Nitzschia</i> , spp.	8	8.2	11.7	6.4	3.5	3.5	17.4	1.8	9.6	7.3	7.9
<i>Rhopalodia</i> , spp.	1	0.0	1.2	0.7	0.0	0.0	0.2	0.4	0.0	0.0	0.0
<i>Sellaphora</i> , spp.	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8
Total		101	100	100	100	100	100	100	100	100	100
Number of Taxa	44	22	23	22	23	19	20	21	19	19	21
Shannon-Weaver Index		2.50	3.43	2.87	3.13	2.58	3.05	2.48	3.11	2.61	2.71
Evenness (H-Hmin)/(Hmax-Hmin)		0.456	0.732	0.598	0.658	0.572	0.676	0.520	0.707	0.578	0.577

Number of replicates: PP-3 (3), PP-4 (3), PP-7 (1), PP-17 (1), PP-18 (1), PP-19 (1)

**EXHIBIT 4-17**

Diatom Density on Porta-PSTA Downstream Endwalls, February 2001

Treatment #	Tank	Soil Type	Cells/cm <sup>2</sup>		Total Number Organisms
			Alive	Dead	
PP-4	3	shell	277,473	89,084	366,556
PP-4	5	shell	5,902	2,208	8,110
PP-4	10	shell	28,150	14,786	42,935
PP-3	12	peat	1,993	997	2,990
PP-3	14	peat	6,821	3,816	10,637
PP-3	17	peat	4,640	1,664	6,304
PP-7	19	sand	99,307	29,378	128,685
PP-17	20	sand	22,650	6,960	29,610
PP-18	21	none	10,673	9,139	19,812
PP-19	22	Aquamat	58,124	30,376	88,500

# Discussion and Conclusions

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## SECTION 5

# Discussion and Conclusions

Final mass balance sampling (biomass, P, and calcium) was conducted on 10 of the 24 Porta-PSTA tanks in February 2001. Mass balances are itemized in Section 4 for periphyton components (floating/metaphyton, benthic, and wall), macrophytes (above- and below-ground), consumers, soils (two depth increments), and water. Of particular interest to the evaluation of the proposed PSTA technology for water quality treatment is the fate of P in these mesocosms. This section briefly compares the estimated mass of P removed during the Porta-PSTA study to the amount quantified at this final mass balance sampling. Quantities of biomass and calcium that accumulated in these test systems were also estimated and described below.

Exhibit 5-1 summarizes the estimated mass of TP loaded to and removed from each of the Porta-PSTA treatments evaluated in this report. These amounts were estimated based on detailed mass balance sampling from April 1999 through early October 2000 in these treatments and have been extrapolated assuming the same inflow and outflow rates and TP concentrations through the beginning of the mass balance sampling on February 13, 2001.

### EXHIBIT 5-1

Porta-PSTA Water Mass Balance Estimates, April 1999–February 2001

Treatment	Number of days	TP (mg/L)		Inflow (m <sup>3</sup> /d)	Outflow (m <sup>3</sup> /d)	MB_TP (mg/m <sup>2</sup> )		Removal (mg/m <sup>2</sup> )	(%)
		Inflow	Outflow			Inflow	Outflow		
PP-3	673	0.026	0.018	0.44	0.42	1242	786	456	36.7
PP-4	673	0.026	0.016	0.45	0.46	1274	809	464	36.4
PP-7	673	0.026	0.017	0.44	0.42	1267	783	484	38.2
PP-17	302	0.031	0.014	0.45	0.48	728	338	390	53.6
PP-18	302	0.031	0.017	0.48	0.55	705	455	250	35.5
PP-19	302	0.031	0.015	0.48	0.52	701	398	303	43.2

Removal of TP was estimated between 456 and 484 mg P/m<sup>2</sup> for the three treatments that were conducted for the full 18-month study period and between 250 and 390 mg P/m<sup>2</sup> for the treatments that were conducted during the 6-month Phase 2 period only. Treatments PP-3, PP-4, and PP-7 underwent significant initial releases of TP during their startup in April and May 1999. The mass balances in Exhibit 5-1 for PP-17 do not reflect an initial period of P release from newly flooded soils, and PP-18 and PP-19 had no soils.

Exhibit 5-2 summarizes the total biomass (AFDW) and TP measured in these same treatments as part of this study. In several of the treatments (PP-3, PP-17, PP-18, and PP-19), the amount of TP that has accumulated in the biotic components of periphyton, macrophytes, and consumers is approximately equal to the total mass of TP removed from the water column. More TP is in the biomass than was removed from the water column in two of the treatments (PP-4 [shellrock soils] with 464 mg P/m<sup>2</sup> removed compared to 626 mg P/m<sup>2</sup> in

biomass and treatment PP-7 [un-rinsed sand] with 484 mg P/m<sup>2</sup> removed from the water compared to 828 mg P/m<sup>2</sup> in the final biomass). One possible explanation for this higher TP mass is that some of the net TP accumulation in the biomass was derived from the soil TP compartment.

#### EXHIBIT 5-2

Porta-PSTA Final Mass Balance Sampling, February 2001

Treatment Number Substrate	PP-3 Peat	PP-4 Shell	PP-7 Sand	PP-17 Sand	PP-18 None	PP-19 Aquamat
<b>Biomass (g AFDW/m<sup>2</sup>)</b>						
Periphyton	78	215	249	177	296	309
Macrophytes	614	304	223	183	0	0
Consumers	0.9	0.1	0.3	0.0	1.3	2.0
Total	693	519	472	360	297	311
<b>Total Phosphorus (mg/m<sup>2</sup>)</b>						
Water	6.1	4.1	4.0	6.9	3.4	3.6
Periphyton	95	391	626	220	184	273
Macrophytes	320	230	195	180	0	0
Consumers	5.3	0.1	2.5	0.0	5.7	9.1
Total	426	626	828	407	193	285

Clearly the soil TP compartment overshadows the biotic TP compartments in the Porta-PSTA treatments evaluated in this study. The soil is likely to be the principal source of nutrients for the rooted macrophytic plants but not for periphyton. Changes in soil TP content through the period of the entire 18-month study and differences between the lower and upper soil level TP concentrations will be examined in the PSTA Research and Demonstration Project final report to further elucidate the transfer of P between the biotic and abiotic components. Inclusion of non-soil Porta-PSTA treatments in this study has helped to confirm that TP removal can be effective through the action of periphyton biotic uptake alone.

Biomass sampling determined that macrophytes were the dominant reserve of new organic matter in the Porta-PSTAs at the end of this study. The macrophyte biomass (614 g AFDW/m<sup>2</sup>) overshadowed the periphyton biomass (78 g AFDW/m<sup>2</sup>) in the peat-based mesocosms, while in the shellrock and sand mesocosms, the amount of biomass in each compartment was approximately equal (approximately 180 to 300 g AFDW/m<sup>2</sup> for each compartment). Periphyton biomass in the shellrock and sand treatments was slightly less than the periphyton biomass that accumulated in the non-soil control tanks that had no competing macrophytes (296 to 309 g AFDW/m<sup>2</sup>). Clearly, macrophyte dominance in the peat mesocosms limited the sustainable amount of periphyton biomass. However, when macrophyte biomass was relatively sparse because of less favorable soils, there was a favorable and nearly even split between macrophyte and periphyton biomass. Consumer



biomass was negligible compared to plant biomass in all treatments (1.3 g AFDW/m<sup>2</sup> or less).

The calcium content of the PSTA soils appeared to have little effect on the calcium content in the periphyton. Shellrock soils had a calcium concentration of approximately 15 percent and periphyton had approximately 22 percent. Peat soils averaged 12 percent calcium, and the periphyton in the peat mesocosms averaged 15 percent%. The sand soils had 0.3% calcium and the acid-rinsed sand soils had 0.07% calcium, yet periphyton in these tanks both had about 11% calcium. The non-soil control tank periphyton had about 23 to 24% calcium. These data indicate that calcium was principally accumulated in the periphyton from the water column rather than from the soils.

# References

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## SECTION 6

# References

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CH2M HILL. June 2001. *PSTA Research and Demonstration Project Phase 2 Interim Report*. April 2000-December 2000. June 2001.

CH2M HILL. April 2001. *Periphyton-Based Stormwater Treatment Area (PSTA) Research and Demonstration Project PSTA Research Plan, Revision No. 3*. April 2001.

CH2M HILL. August 2000. *PSTA Research and Demonstration Project Phase 1 Summary Report*. February 1999 to March 2000. August 2000.

CH2M HILL. February 2001. *Periphyton-Based Stormwater Treatment Area Research and Demonstration Project Porta-PSTA Mass Balance (Destructive) Sampling Plan*. February 2001.

# Detailed Porta-PSTA Destructive Summaries

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Appendix A-1  
Porta-PSTA Final Sampling Summary of Peat-Based Treatment (PP-3)

	Tank No.								
	12			14			17		
Soil Type	Rep 1	Rep 2	Average	Rep 1	Rep 2	Average	Rep 1	Rep 2	Average
Tank Bottom Area (m <sup>2</sup> )	Peat	Peat	Peat	Peat	Peat	Peat	Peat	Peat	Peat
Water Depth (m)	6	6	6	6	6	6	6	6	6
	0.27	0.27	0.27	0.31	0.31	0.31	0.34	0.34	0.34
Inflow Phosphorus, Water (g/m <sup>3</sup> )									
TP	0.020	--	0.020	0.020	--	0.020	0.020	--	0.020
TDP	0.009	--	0.009	0.009	--	0.009	0.009	--	0.009
SRP	0.006	--	0.006	0.006	--	0.006	0.006	--	0.006
DOP	0.004	--	0.004	0.004	--	0.004	0.004	--	0.004
TPP	0.010	--	0.010	0.010	--	0.010	0.010	--	0.010
Outflow Phosphorus, Water (g/m <sup>3</sup> )									
TP	0.037	--	0.037	0.013	--	0.013	0.012	--	0.012
TDP	0.009	--	0.009	0.006	--	0.006	0.008	--	0.008
SRP	0.001	--	0.001	0.004	--	0.004	0.004	--	0.004
DOP	0.008	--	0.008	0.002	--	0.002	0.004	--	0.004
TPP	0.028	--	0.028	0.007	--	0.007	0.004	--	0.004
Phosphorus, Water (mg/m <sup>2</sup> )									
TP	10.14	--	10.14	3.98	--	3.98	4.05	--	4.05
TDP	2.47	--	2.47	1.83	--	1.83	2.70	--	2.70
SRP	0.27	--	0.27	1.22	--	1.22	1.35	--	1.35
DOP	2.19	--	2.19	0.61	--	0.61	1.35	--	1.35
TPP	7.67	--	7.67	2.14	--	2.14	1.35	--	1.35
Periphyton (g DW/m <sup>2</sup> )									
Floating Mat/Metaphyton	0.00	0.00	0.00	74.66	70.58	72.62	3.14	2.68	2.91
Benthic Mat	0.00	0.00	0.00	163.99	143.32	153.66	134.05	112.85	123.45
Wall Mat	12.04	15.42	13.73	30.99	29.75	30.37	4.40	10.63	7.51
Total	12.04	15.42	13.73	269.64	243.65	256.64	141.60	126.16	133.88
Periphyton (g wet/m <sup>2</sup> )									
Floating Mat/Metaphyton	0.00	--	0.00	1522.81	--	1522.81	81.33	--	81.33
Benthic Mat	0.00	--	0.00	3085.22	--	3085.22	1334.23	--	1334.23
Wall Mat	48.83	--	48.83	460.14	--	460.14	59.67	--	59.67
Total	48.83	--	48.83	5068.18	--	5068.18	1475.23	--	1475.23
Periphyton (g AFDW/m <sup>2</sup> )									
Floating Mat/Metaphyton	0.00	0.00	0.00	38.22	37.72	37.97	1.06	0.90	0.98
Benthic Mat	0.00	0.00	0.00	107.46	97.91	102.68	78.99	65.42	72.20
Wall Mat	3.47	4.38	3.93	13.83	13.69	13.76	1.58	3.45	2.51
Total	3.47	4.38	3.93	159.51	149.31	154.41	81.64	69.77	75.70
Periphyton (g ash/m <sup>2</sup> )									
Floating Mat/Metaphyton	0.00	0.00	0.00	36.44	32.86	34.65	2.08	1.78	1.93
Benthic Mat	0.00	0.00	0.00	56.54	45.41	50.97	55.06	47.43	51.25
Wall Mat	8.58	11.04	9.81	17.16	16.06	16.61	2.82	7.18	5.00
Total	8.58	11.04	9.81	110.13	94.33	102.23	59.96	56.39	58.18
Periphyton TP (mg/m <sup>2</sup> )									
Floating Mat/Metaphyton	0.00	0.00	0.00	53.89	48.72	51.30	1.40	1.06	1.23
Benthic Mat	0.00	0.00	0.00	126.64	107.66	117.15	104.72	73.08	88.90
Wall Mat	2.85	3.91	3.38	18.24	18.43	18.33	2.81	6.82	4.81
Total	2.85	3.91	3.38	198.78	174.81	186.79	108.93	80.97	94.95
Periphyton TP (mg/kg)									
Floating Mat/Metaphyton	--	--	--	721.84	690.25	706.05	446.62	396.49	421.56
Benthic Mat	--	--	--	772.24	751.19	761.72	781.20	647.61	714.41
Wall Mat	236.39	253.58	244.98	588.64	619.41	604.03	637.33	641.76	639.54
Average	236.39	253.58	246.04	737.19	717.45	727.82	769.30	641.78	709.22
Periphyton TIP (mg/m <sup>2</sup> )									
Floating Mat/Metaphyton	0.00	0.00	0.00	7.65	8.36	8.00	0.13	0.15	0.14
Benthic Mat	0.00	0.00	0.00	19.59	24.00	21.79	15.49	12.55	14.02
Wall Mat	0.64	0.59	0.62	2.28	2.57	2.43	0.65	0.90	0.77
Total	0.64	0.59	0.62	29.52	34.92	32.22	16.26	13.59	14.93
Periphyton TIP (mg/kg)									
Floating Mat/Metaphyton	--	--	--	102.42	118.39	110.40	40.27	54.16	47.21
Benthic Mat	--	--	--	119.46	167.43	143.45	115.52	111.23	113.37
Wall Mat	53.55	38.53	46.04	73.51	86.46	79.98	146.49	84.28	115.39
Average	53.55	38.53	45.11	109.46	143.34	125.54	114.81	107.75	111.48
Periphyton Ca (g/m <sup>2</sup> )									
Floating Mat/Metaphyton	0.00	0.00	0.00	16.94	6.60	11.77	0.51	0.85	0.68
Benthic Mat	0.00	0.00	0.00	15.36	9.42	12.39	9.19	9.62	9.41
Wall Mat	2.77	4.12	3.45	5.75	5.95	5.85	0.54	2.73	1.63
Total	2.77	4.12	3.45	38.05	21.97	30.01	10.23	13.21	11.72
Periphyton Ca (mg/kg)									
Floating Mat/Metaphyton	--	--	--	226962	93522	160242	160769	318018	239394
Benthic Mat	--	--	--	93643	65698	79670	68544	85281	76912
Wall Mat	229969	267303	248636	185441	200000	192720	122283	256757	189520
Average	229969	267303	250938	141107	90156	116922	72263	104674	87534
Macrophyte TP (mg/m <sup>2</sup> )									
Aboveground	248.17	259.10	253.63	139.13	108.68	123.90	173.41	142.23	157.82
Belowground	212.44	258.54	235.49	163.89	90.68	127.28	67.51	51.98	59.75
Total	460.62	517.64	489.13	303.02	199.36	251.19	240.92	194.21	217.57

## Appendix A-1

## Porta-PTSA Final Sampling Summary of Peat-Based Treatment (PP-3)

	Tank No.								
	12			14			17		
Soil Type	Rep 1	Rep 2	Average	Rep 1	Rep 2	Average	Rep 1	Rep 2	Average
Tank Bottom Area (m <sup>2</sup> )	6	6	6	6	6	6	6	6	6
Water Depth (m)	0.27	0.27	0.27	0.31	0.31	0.31	0.34	0.34	0.34
Macrophyte TP (mg/kg)									
Aboveground	402.9	441.1	422.0	297.1	243.6	270.3	383.5	243.6	313.6
Belowground	1185.2	1554.2	1369.7	660.2	432.5	546.4	775.8	648.3	712.0
Average	794.0	997.6	895.8	478.7	338.0	408.3	579.7	445.9	512.8
Macrophyte (g wet/m <sup>2</sup> )									
Aboveground	2437.6	--	2437.6	3914.0	--	3914.0	3595.2	--	3595.2
Belowground	1175.3	--	1175.3	2182.8	--	2182.8	737.5	--	737.5
Total	3620.8	--	3620.8	6110.1	--	6110.1	4342.1	--	4342.1
Macrophyte (g DW/m <sup>2</sup> )									
Aboveground	616.0	587.4	601.7	468.3	446.1	457.2	452.2	583.9	518.0
Belowground	179.2	166.3	172.8	248.2	209.7	228.9	87.0	80.2	83.6
Total	795.3	753.7	774.5	716.6	655.8	686.2	539.2	664.1	601.6
Macrophyte (g AFDW/m <sup>2</sup> )									
Aboveground	553.8	521.6	537.7	424.3	400.6	412.5	397.4	523.7	460.6
Belowground	161.7	152.5	157.1	212.2	188.5	200.4	76.8	69.3	73.1
Total	715.5	674.1	694.8	636.5	589.1	612.8	474.3	593.0	533.7
Macrophyte (g ash/m <sup>2</sup> )									
Aboveground	62.2	65.8	64.0	44.0	45.5	44.8	54.7	60.1	57.4
Belowground	17.6	13.8	15.7	36.0	21.2	28.6	10.2	10.9	10.5
Total	79.8	79.6	79.7	80.0	66.7	73.3	64.9	71.0	68.0
Macrophyte Ca (g/m <sup>2</sup> )									
Aboveground	3.42	3.23	3.32	2.41	2.50	2.45	5.20	4.14	4.67
Belowground	0.80	0.80	0.80	3.13	2.12	2.62	0.38	0.67	0.52
Total	4.22	4.03	4.13	5.53	4.62	5.08	5.58	4.81	5.19
Macrophyte Ca (mg/kg)									
Aboveground	5550	5500	5525	5140	5600	5370	11500	7090	9295
Belowground	4460	4830	4645	12600	10100	11350	4340	8360	6350
Average	5304	5352	5328	7724	7039	7397	10344	7243	8633
Consumers									
TP (mg/m <sup>2</sup> )	15.16	--	15.16	0.02	--	0.02	0.81	--	0.81
TP (mg/kg)	5016.0	--	5016.0	209.7	--	209.7	1980.7	--	1980.7
Ca (g/m <sup>2</sup> )	0.532	--	0.532	0.015	--	0.015	0.010	--	0.010
Ca (mg/kg)	175871	--	175871	137353	--	137353	24561	--	24561
Wet Weight (g/m <sup>2</sup> )	46.83	--	46.83	12.67	--	12.67	8.00	--	8.00
Dry Weight (g/m <sup>2</sup> )	3.02	--	3.02	0.11	--	0.11	0.41	--	0.41
Ash Weight (g/m <sup>2</sup> )	0.33	--	0.33	0.03	--	0.03	0.35	--	0.35
AFDW (g/m <sup>2</sup> )	2.70	--	2.70	0.08	--	0.08	0.06	--	0.06
Soil TP (mg/m <sup>2</sup> )									
Upper (0-10 cm)	5013	3176	4095	4229	2853	3541	4233	3818	4026
Lower (10-20 cm)	6051	5732	5891	6097	5310	5703	5556	4689	5123
Total	11064	8908	9986	10326	8163	9245	9790	8507	9148
Soil TP (mg/kg)									
Upper (0-10 cm)	131.9	113.4	122.7	128.2	86.5	107.3	141.1	131.7	136.4
Lower (10-20 cm)	144.1	139.8	141.9	148.7	129.5	139.1	135.5	117.2	126.4
Average (0-20 cm)	138.0	126.6	132.3	138.4	108.0	123.2	138.3	124.4	131.4
Soil TIP (mg/m <sup>2</sup> )									
Upper (0-10 cm)	5538	--	5538	1471	--	1471	2723	--	2723
Lower (10-20 cm)	4829	--	4829	3347	--	3347	3603	--	3603
Total	10367	--	10367	4818	--	4818	6326	--	6326
Soil TIP (mg/kg)									
Upper (0-10 cm)	145.7	--	145.7	44.6	--	44.6	90.8	--	90.8
Lower (10-20 cm)	115.0	--	115.0	81.6	--	81.6	87.9	--	87.9
Average (0-20 cm)	130.4	--	130.4	63.1	--	63.1	89.3	--	89.3
Soil Ca (g/m <sup>2</sup> )									
Upper (0-10 cm)	334	3668	2001	667	9735	5201	7740	2024	4882
Lower (10-20 cm)	4662	5084	4873	3883	3719	3801	7134	3728	5431
Total	4996	8752	6874	4549	13454	9002	14874	5752	10313
Soil Ca (mg/kg)									
Upper (0-10 cm)	8790	131000	69895	20200	295000	157600	258000	69800	163900
Lower (10-20 cm)	111000	124000	117500	94700	90700	92700	174000	93200	133600
Average (0-20 cm)	59895	127500	93698	57450	192850	125150	216000	81500	148750
Soil Percent Solids									
Upper (0-10 cm)	27.6	21.6	24.6	23.4	38.2	30.8	36.4	22.7	29.6
Lower (10-20 cm)	26.6	27.0	26.8	27.9	22.6	25.3	28.0	37.2	32.6
Average (0-20 cm)	27.1	24.3	25.7	25.7	30.4	28.0	32.2	30.0	31.1
Soil Dry Bulk Density (g/cm <sup>3</sup> )									
Upper (0-10 cm)	0.380	0.280	0.330	0.330	0.330	0.330	0.300	0.290	0.295
Lower (10-20 cm)	0.420	0.410	0.415	0.410	0.410	0.410	0.410	0.400	0.405
Average (0-20 cm)	0.400	0.345	0.373	0.370	0.370	0.370	0.355	0.345	0.350

Note:

-- = no data



Appendix A-2  
Porta-PSTA Final Sampling Summary of Shellrock-Based Treatment (PP-4)

Soil Type	Tank No.								
	3			5			10		
	Rep 1 Shell 6	Rep 2 Shell 6	Average Shell 6	Rep 1 Shell 6	Rep 2 Shell 6	Average Shell 6	Rep 1 Shell 6	Rep 2 Shell 6	Average Shell 6
Tank Bottom Area (m <sup>2</sup> )									
Water Depth (m)	0.37	0.37	0.37	0.38	0.38	0.38	0.36	0.36	0.36
Inflow Phosphorus, Water (g/m <sup>3</sup> )									
TP	0.020	--	0.020	0.020	--	0.020	0.020	--	0.020
TDP	0.009	--	0.009	0.009	--	0.009	0.009	--	0.009
SRP	0.006	--	0.006	0.006	--	0.006	0.006	--	0.006
DOP	0.004	--	0.004	0.004	--	0.004	0.004	--	0.004
TPP	0.010	--	0.010	0.010	--	0.010	0.010	--	0.010
Outflow Phosphorus, Water (g/m <sup>3</sup> )									
TP	0.010	--	0.010	0.013	--	0.013	0.010	--	0.010
TDP	0.007	--	0.007	0.008	--	0.008	0.006	--	0.006
SRP	0.003	--	0.003	0.003	--	0.003	0.002	--	0.002
DOP	0.004	--	0.004	0.005	--	0.005	0.004	--	0.004
TPP	0.003	--	0.003	0.005	--	0.005	0.004	--	0.004
Phosphorus, Water (mg/m <sup>2</sup> )									
TP	3.75	--	3.75	4.93	--	4.93	3.63	--	3.63
TDP	2.62	--	2.62	3.03	--	3.03	2.18	--	2.18
SRP	1.12	--	1.12	1.14	--	1.14	0.73	--	0.73
DOP	1.50	--	1.50	1.89	--	1.89	1.45	--	1.45
TPP	1.12	--	1.12	1.89	--	1.89	1.45	--	1.45
Periphyton (g DW/m <sup>2</sup> )									
Floating Mat/Metaphyton	278.10	222.81	250.45	48.94	52.17	50.56	169.07	178.41	173.74
Benthic Mat	697.14	669.43	683.29	475.78	664.29	570.03	395.83	411.64	403.73
Wall Mat	282.57	236.23	259.40	53.77	64.23	59.00	243.63	232.00	237.82
Total	1257.81	1128.47	1193.14	578.49	780.69	679.59	808.53	822.05	815.29
Periphyton (g wet/m <sup>2</sup> )									
Floating Mat/Metaphyton	5103.33	--	5103.33	813.33	--	813.33	3446.67	--	3446.67
Benthic Mat	8693.33	--	8693.33	3515.00	--	3515.00	6728.33	--	6728.33
Wall Mat	3478.33	--	3478.33	870.00	--	870.00	2933.33	--	2933.33
Total	17275.00	--	17275.00	5198.33	--	5198.33	13108.33	--	13108.33
Periphyton (g AFDW/m <sup>2</sup> )									
Floating Mat/Metaphyton	72.03	54.18	63.10	12.77	13.29	13.03	42.58	45.34	43.96
Benthic Mat	145.81	130.78	138.30	103.33	109.66	106.50	113.36	127.43	120.39
Wall Mat	77.51	64.33	70.92	14.64	17.22	15.93	74.78	69.11	71.94
Total	295.35	249.30	272.32	130.74	140.17	135.45	230.71	241.88	236.30
Periphyton (g ash/m <sup>2</sup> )									
Floating Mat/Metaphyton	206.07	168.34	187.21	36.17	38.89	37.53	126.68	132.97	129.83
Benthic Mat	551.33	538.65	544.99	372.45	554.63	463.54	282.47	284.20	283.34
Wall Mat	205.06	171.90	188.48	39.13	47.01	43.07	168.85	162.90	165.87
Total	962.46	878.89	920.68	447.75	640.52	544.14	578.01	580.07	579.04
Periphyton TP (mg/m <sup>2</sup> )									
Floating Mat/Metaphyton	106.72	81.83	94.27	14.09	16.13	15.11	35.53	38.56	37.04
Benthic Mat	367.38	435.27	401.33	238.94	326.25	282.59	217.73	258.71	238.22
Wall Mat	56.34	44.86	50.60	15.76	20.35	18.06	38.16	36.11	37.13
Total	530.44	561.96	546.20	268.79	362.72	315.76	291.42	333.38	312.40
Periphyton TP (mg/kg)									
Floating Mat/Metaphyton	383.73	367.26	375.50	287.86	309.07	298.46	210.13	216.12	213.12
Benthic Mat	526.98	650.21	588.60	502.21	491.13	496.67	550.07	628.49	589.28
Wall Mat	199.38	189.89	194.64	293.07	316.82	304.95	156.63	155.64	156.13
Average	421.71	497.98	457.78	464.64	464.62	464.63	360.43	405.55	383.17
Periphyton TIP (mg/m <sup>2</sup> )									
Floating Mat/Metaphyton	43.34	45.73	44.53	6.05	6.43	6.24	9.46	11.59	10.52
Benthic Mat	209.45	162.69	186.07	130.93	98.07	114.50	94.03	93.53	93.78
Wall Mat	25.94	16.55	21.24	5.80	4.65	5.22	12.22	12.57	12.40
Total	278.72	224.97	251.85	142.77	109.15	125.96	115.71	117.69	116.70
Periphyton TIP (mg/kg)									
Floating Mat/Metaphyton	155.83	205.25	180.54	123.57	123.16	123.36	55.94	64.95	60.45
Benthic Mat	300.43	243.03	271.73	275.18	147.64	211.41	237.55	227.22	232.39
Wall Mat	91.79	70.05	80.92	107.86	72.32	90.09	50.18	54.18	52.18
Average	221.59	199.36	211.08	246.80	139.81	185.35	143.11	143.17	143.14
Periphyton Ca (g/m <sup>2</sup> )									
Floating Mat/Metaphyton	78.03	55.17	66.60	12.06	12.80	12.43	36.96	47.59	42.27
Benthic Mat	161.76	105.96	133.86	57.02	104.74	80.88	86.84	82.14	84.49
Wall Mat	69.27	138.44	103.86	16.77	15.28	16.03	65.13	71.58	68.35
Total	309.05	299.57	304.31	85.85	132.82	109.33	188.93	201.31	195.12
Periphyton Ca (mg/kg)									
Floating Mat/Metaphyton	280576	247619	264097	248377	245370	245874	218592	266756	242674
Benthic Mat	232026	158278	195152	119844	157672	138758	219400	199555	209477
Wall Mat	245136	586057	415596	311881	237903	274892	267327	308511	287919
Average	245706	265467	255051	148398	170134	160883	233672	244889	239327
Macrophyte TP (mg/m <sup>2</sup> )									
Aboveground	151.52	129.00	140.26	75.71	159.12	117.42	157.64	138.64	148.14
Belowground	162.71	114.55	138.63	34.58	37.36	35.97	75.70	146.99	111.35
Total	314.23	243.54	278.88	110.29	196.48	153.39	233.34	285.64	259.49

Appendix A-2  
Porta-PSTA Final Sampling Summary of Shellrock-Based Treatment (PP-4)

	Tank No.								
	3			5			10		
Soil Type	Rep 1	Rep 2	Average	Rep 1	Rep 2	Average	Rep 1	Rep 2	Average
Tank Bottom Area (m <sup>2</sup> )	Shell	Shell	Shell	Shell	Shell	Shell	Shell	Shell	Shell
Water Depth (m)	6	6	6	6	6	6	6	6	6
	0.37	0.37	0.37	0.38	0.38	0.38	0.36	0.36	0.36
Macrophyte TP (mg/kg)									
Aboveground	729.3	657.0	693.1	520.6	788.3	654.4	366.9	285.9	326.4
Belowground	953.7	1008.5	981.1	1152.2	1140.8	1146.5	565.2	1041.1	803.1
Average	841.5	832.8	837.1	836.4	964.5	900.4	466.1	663.5	564.8
Macrophyte (g wet/m <sup>2</sup> )									
Aboveground	1518.9	--	1518.9	862.4	--	862.4	2364.8	--	2364.8
Belowground	906.6	--	906.6	214.3	--	214.3	1090.2	--	1090.2
Total	2420.0	--	2420.0	1076.7	--	1076.7	3455.0	--	3455.0
Macrophyte (g DW/m <sup>2</sup> )									
Aboveground	207.8	196.3	202.1	145.4	201.9	173.7	429.6	484.9	457.3
Belowground	170.6	113.6	142.1	30.0	32.7	31.4	133.9	141.2	137.6
Total	378.4	309.9	344.1	175.4	234.6	205.0	563.6	626.1	594.8
Macrophyte (g AFDW/m <sup>2</sup> )									
Aboveground	175.1	165.7	170.4	124.5	178.7	151.6	381.1	420.9	401.0
Belowground	60.2	55.7	57.9	18.8	25.6	22.2	99.9	121.6	110.7
Total	235.4	221.4	228.4	143.3	204.3	173.8	481.0	542.5	511.7
Macrophyte (g ash/m <sup>2</sup> )									
Aboveground	32.6	30.6	31.6	20.9	23.2	22.1	48.6	64.0	56.3
Belowground	110.4	57.9	84.2	11.2	7.1	9.1	34.0	19.6	26.8
Total	143.0	88.6	115.8	32.1	30.3	31.2	82.6	83.6	83.1
Macrophyte Ca (g/m <sup>2</sup> )									
Aboveground	5.48	3.48	4.48	3.42	1.42	2.42	5.11	8.05	6.58
Belowground	14.37	15.67	15.02	2.02	0.87	1.45	4.18	2.03	3.11
Total	19.85	19.15	19.50	5.44	2.30	3.87	9.29	10.08	9.69
Macrophyte Ca (mg/kg)									
Aboveground	26400	17700	22050	23500	7040	15270	11900	16600	14250
Belowground	84200	138000	111100	67300	26700	47000	31200	14400	22800
Average	52462	61788	56661	30992	9784	18858	16487	16104	16285
Consumers									
TP (mg/m <sup>2</sup> )	0.22	--	0.22	0.05	--	0.05	0.17	--	0.17
TP (mg/kg)	373.5	--	373.5	668.5	--	668.5	670.1	--	670.1
Ca (g/m <sup>2</sup> )	0.049	--	0.049	0.004	--	0.004	0.035	--	0.035
Ca (mg/kg)	82826	--	82826	48965	--	48965	139169	--	139169
Wet Weight (g/m <sup>2</sup> )	15.17	--	15.17	5.17	--	5.17	16.83	--	16.83
Dry Weight (g/m <sup>2</sup> )	0.59	--	0.59	0.07	--	0.07	0.25	--	0.25
Ash Weight (g/m <sup>2</sup> )	0.39	--	0.39	0.05	--	0.05	0.12	--	0.12
AFDW (g/m <sup>2</sup> )	0.20	--	0.20	0.02	--	0.02	0.13	--	0.13
Soil TP (mg/m <sup>2</sup> )									
Upper (0-10 cm)	114911	158652	136781	131261	138510	134886	126204	153632	139918
Lower (10-20 cm)	135865	137994	136930	137471	136009	136740	115475	138225	126850
Total	250776	296646	273711	268732	274519	271626	241679	291856	266767
Soil TP (mg/kg)									
Upper (0-10 cm)	973.8	1057.7	1015.7	965.2	1065.5	1015.3	876.4	1038.1	957.2
Lower (10-20 cm)	970.5	965.0	967.7	875.6	850.1	862.8	916.5	973.4	944.9
Average (0-20 cm)	972.1	1011.3	991.7	920.4	957.8	939.1	896.4	1005.7	951.1
Soil TIP (mg/m <sup>2</sup> )									
Upper (0-10 cm)	115928	--	115928	135186	--	135186	134663	--	134663
Lower (10-20 cm)	135029	--	135029	132545	--	132545	114345	--	114345
Total	250957	--	250957	267732	--	267732	249008	--	249008
Soil TIP (mg/kg)									
Upper (0-10 cm)	982.4	--	982.4	994.0	--	994.0	935.2	--	935.2
Lower (10-20 cm)	964.5	--	964.5	844.2	--	844.2	907.5	--	907.5
Average (0-20 cm)	973.5	--	973.5	919.1	--	919.1	921.3	--	921.3
Soil Ca (g/m <sup>2</sup> )									
Upper (0-10 cm)	14868	24450	19659	23664	16900	20282	20448	18944	19696
Lower (10-20 cm)	20160	21879	21020	30301	26240	28271	20412	23714	22063
Total	35028	46329	40679	53965	43140	48553	40860	42658	41759
Soil Ca (mg/kg)									
Upper (0-10 cm)	126000	163000	144500	174000	130000	152000	142000	128000	135000
Lower (10-20 cm)	144000	153000	148500	193000	164000	178500	162000	167000	164500
Average (0-20 cm)	135000	158000	146500	183500	147000	165250	152000	147500	149750
Soil Percent Solids									
Upper (0-10 cm)	69.6	71.2	70.4	74.7	72.2	73.5	63.3	62.0	62.7
Lower (10-20 cm)	85.4	82.7	84.1	82.6	79.5	81.1	76.3	67.5	71.9
Average (0-20 cm)	77.5	77.0	77.2	78.7	75.9	77.3	69.8	64.8	67.3
Soil Dry Bulk Density (g/cm <sup>3</sup> )									
Upper (0-10 cm)	1.180	1.500	1.340	1.360	1.300	1.330	1.440	1.480	1.460
Lower (10-20 cm)	1.400	1.430	1.415	1.570	1.600	1.585	1.260	1.420	1.340
Average (0-20 cm)	1.290	1.465	1.378	1.465	1.450	1.458	1.350	1.450	1.400

Note:

-- = no data

**Appendix A-3**

**Porta-PSTA Final Sampling Summary of Sand-Based Treatments (PP-7 and PP-17)**

	Treatment and Tank No.					
	PP-7			PP-17		
	Rep 1	Rep 2	Average	Rep 1	Rep 2	Average
<b>Soil Type</b>	<b>Sand</b>	<b>Sand</b>	<b>Sand</b>	<b>Sand</b>	<b>Sand</b>	<b>Sand</b>
<b>Tank Bottom Area (m<sup>2</sup>)</b>	<b>6</b>	<b>6</b>	<b>6</b>	<b>6</b>	<b>6</b>	<b>6</b>
<b>Water Depth (m)</b>	<b>0.37</b>	<b>0.37</b>	<b>0.37</b>	<b>0.33</b>	<b>0.33</b>	<b>0.33</b>
Inflow Phosphorus, Water (g/m <sup>3</sup> )						
TP	0.020	--	0.020	0.020	--	0.020
TDP	0.009	--	0.009	0.009	--	0.009
SRP	0.006	--	0.006	0.006	--	0.006
DOP	0.004	--	0.004	0.004	--	0.004
TPP	0.010	--	0.010	0.010	--	0.010
Outflow Phosphorus, Water (g/m <sup>3</sup> )						
TP	0.011	--	0.011	0.021	--	0.021
TDP	0.007	--	0.007	0.014	--	0.014
SRP	0.001	--	0.001	0.003	--	0.003
DOP	0.006	--	0.006	0.011	--	0.011
TPP	0.004	--	0.004	0.007	--	0.007
Phosphorus, Water (mg/m <sup>2</sup> )						
TP	4.03	--	4.03	6.88	--	6.88
TDP	2.56	--	2.56	4.58	--	4.58
SRP	0.37	--	0.37	0.98	--	0.98
DOP	2.20	--	2.20	3.60	--	3.60
TPP	1.46	--	1.46	2.29	--	2.29
Periphyton (g DW/m <sup>2</sup> )						
Floating Mat/Metaphyton	174.84	302.84	238.84	232.50	227.35	229.92
Benthic Mat	1709.91	1918.68	1814.30	668.94	951.39	810.16
Wall Mat	87.50	145.21	116.35	4.25	2.32	3.28
Total	1972.25	2366.72	2169.49	905.69	1181.05	1043.37
Periphyton (g wet/m <sup>2</sup> )						
Floating Mat/Metaphyton	2835.00	--	2835.00	3250.00	--	3250.00
Benthic Mat	13155.00	--	13155.00	7485.00	--	7485.00
Wall Mat	1058.33	--	1058.33	378.33	--	378.33
Total	17048.33	--	17048.33	11113.33	--	11113.33
Periphyton (g AFDW/m <sup>2</sup> )						
Floating Mat/Metaphyton	46.91	70.60	58.75	55.33	53.82	54.58
Benthic Mat	164.64	170.43	167.54	108.20	134.21	121.20
Wall Mat	23.35	22.88	23.11	1.54	0.81	1.18
Total	234.90	263.91	249.40	165.08	188.84	176.96
Periphyton (g ash/m <sup>2</sup> )						
Floating Mat/Metaphyton	128.00	232.24	180.12	177.17	173.53	175.35
Benthic Mat	1545.27	1745.82	1645.55	560.31	816.57	688.44
Wall Mat	64.15	122.33	93.24	2.70	35.37	19.03
Total	1737.42	2100.39	1918.91	740.18	1025.46	882.82
Periphyton TP (mg/m <sup>2</sup> )						
Floating Mat/Metaphyton	40.29	66.52	53.40	65.43	64.61	65.02
Benthic Mat	553.69	555.79	554.74	114.55	190.01	152.28
Wall Mat	13.78	22.86	18.32	3.06	1.47	2.27
Total	607.76	645.17	626.46	183.04	256.09	219.57
Periphyton TP (mg/kg)						
Floating Mat/Metaphyton	230.45	219.65	225.05	281.40	284.20	282.80
Benthic Mat	323.81	289.67	306.74	171.24	199.72	185.48
Wall Mat	157.44	157.44	157.44	720.84	635.58	678.21
Average	308.15	272.60	288.76	202.10	216.84	210.44

Appendix A-3

Porta-PSTA Final Sampling Summary of Sand-Based Treatments (PP-7 and PP-17)

	Treatment and Tank No.					
	PP-7			PP-17		
	Rep 1	Rep 2	Average	Rep 1	Rep 2	Average
Soil Type	Sand	Sand	Sand	Sand	Sand	Sand
Tank Bottom Area (m <sup>2</sup> )	6	6	6	6	6	6
Water Depth (m)	0.37	0.37	0.37	0.33	0.33	0.33
Periphyton TIP (mg/m <sup>2</sup> )						
Floating Mat/Metaphyton	6.03	8.74	7.38	11.30	9.46	10.38
Benthic Mat	30.57	41.75	36.16	30.04	34.80	32.42
Wall Mat	1.92	2.74	2.33	0.10	0.34	0.22
Total	38.52	53.22	45.87	41.44	44.59	43.01
Periphyton TIP (mg/kg)						
Floating Mat/Metaphyton	34.49	28.85	31.67	48.59	41.59	45.09
Benthic Mat	17.88	21.76	19.82	44.91	36.58	40.74
Wall Mat	21.95	18.85	20.40	23.15	144.88	84.01
Average	19.53	22.49	21.14	45.75	37.75	41.23
Periphyton Ca (g/m <sup>2</sup> )						
Floating Mat/Metaphyton	49.81	39.65	44.73	45.92	41.29	43.61
Benthic Mat	141.81	193.60	167.70	64.75	80.28	72.51
Wall Mat	25.00	21.64	23.32	0.85	0.44	0.64
Total	216.62	254.89	235.76	111.52	122.01	116.76
Periphyton Ca (mg/kg)						
Floating Mat/Metaphyton	284906	130937	207921	197495	181633	189564
Benthic Mat	82932	100901	91916	96795	84380	90587
Wall Mat	285714	149057	217385	200000	190090	195045
Average	109833	107699	108669	123130	103308	111911
Macrophyte TP (mg/m <sup>2</sup> )						
Aboveground	92.99	82.82	87.91	107.45	69.33	88.39
Belowground	123.48	90.20	106.84	107.37	76.53	91.95
Total	216.47	173.02	194.75	214.81	145.86	180.34
Macrophyte TP (mg/kg)						
Aboveground	556.7	462.4	509.6	744.8	428.3	586.5
Belowground	1499.1	1168.0	1333.6	1470.4	1084.6	1277.5
Average	1027.9	815.2	921.6	1107.6	756.5	932.0
Macrophyte (g wet/m <sup>2</sup> )						
Aboveground	829.6	--	829.6	626.6	--	626.6
Belowground	663.7	--	663.7	476.8	--	476.8
Total	1493.3	--	1493.3	1103.3	--	1103.3
Macrophyte (g DW/m <sup>2</sup> )						
Aboveground	167.0	179.1	173.1	144.3	161.9	153.1
Belowground	82.4	77.2	79.8	73.0	70.6	71.8
Total	249.4	256.3	252.9	217.3	232.4	224.9
Macrophyte (g AFDW/m <sup>2</sup> )						
Aboveground	147.5	157.8	152.6	104.9	142.9	123.9
Belowground	71.7	68.4	70.0	62.4	55.9	59.2
Total	219.2	226.2	222.7	167.3	198.8	183.1
Macrophyte (g ash/m <sup>2</sup> )						
Aboveground	19.5	21.3	20.4	39.4	18.9	29.2
Belowground	10.7	8.8	9.8	10.6	14.7	12.6
Total	30.3	30.1	30.2	50.0	33.6	41.8
Macrophyte Ca (g/m <sup>2</sup> )						
Aboveground	0.75	1.13	0.94	2.16	1.14	1.65
Belowground	0.45	0.44	0.45	0.60	0.49	0.54
Total	1.20	1.58	1.39	2.76	1.63	2.20

Appendix A-3

Porta-PSTA Final Sampling Summary of Sand-Based Treatments (PP-7 and PP-17)

	Treatment and Tank No.					
	PP-7			PP-17		
	19			20		
Soil Type	Rep 1 Sand	Rep 2 Sand	Average Sand	Rep 1 Sand	Rep 2 Sand	Average Sand
Tank Bottom Area (m <sup>2</sup> )	6	6	6	6	6	6
Water Depth (m)	0.37	0.37	0.37	0.33	0.33	0.33
Macrophyte Ca (mg/kg)						
Aboveground	4520	6330	5425	15000	7050	11025
Belowground	5440	5760	5600	8220	6900	7560
Average	4824	6158	5500	12722	7004	9767
Consumers						
TP (mg/m <sup>2</sup> )	2.47	--	2.47	0.01	--	0.01
TP (mg/kg)	4066.7	--	4066.7	160.6	--	160.6
Ca (g/m <sup>2</sup> )	0.089	--	0.089	0.008	--	0.008
Ca (mg/kg)	146336	--	146336	175425	--	175425
Wet Weight (g/m <sup>2</sup> )	15.50	--	15.50	6.50	--	6.50
Dry Weight (g/m <sup>2</sup> )	0.61	--	0.61	0.04	--	0.04
Ash Weight (g/m <sup>2</sup> )	0.34	--	0.34	0.02	--	0.02
AFDW (g/m <sup>2</sup> )	0.27	--	0.27	0.02	--	0.02
Soil TP (mg/m <sup>2</sup> )						
Upper (0-10 cm)	3239	3113	3176	2705	2222	2463
Lower (10-20 cm)	2470	2429	2450	3019	3405	3212
Total	5708	5542	5625	5724	5627	5675
Soil TP (mg/kg)						
Upper (0-10 cm)	24.5	23.2	23.9	19.5	17.4	18.4
Lower (10-20 cm)	16.7	15.9	16.3	19.0	21.7	20.3
Average (0-20 cm)	20.6	19.6	20.1	19.2	19.5	19.4
Soil TIP (mg/m <sup>2</sup> )						
Upper (0-10 cm)	1384	--	1384	1361	--	1361
Lower (10-20 cm)	1356	--	1356	1086	--	1086
Total	2740	--	2740	2447	--	2447
Soil TIP (mg/kg)						
Upper (0-10 cm)	10.5	--	10.5	9.8	--	9.8
Lower (10-20 cm)	9.2	--	9.2	6.8	--	6.8
Average (0-20 cm)	9.8	--	9.8	8.3	--	8.3
Soil Ca (g/m <sup>2</sup> )						
Upper (0-10 cm)	764.28	723.6	744	79.091	86.784	83
Lower (10-20 cm)	93.24	86.139	90	80.772	185.26	133
Total	858	810	834	160	272	216
Soil Ca (mg/kg)						
Upper (0-10 cm)	5790	5400	5595	569	678	624
Lower (10-20 cm)	630	563	597	508	1180	844
Average (0-20 cm)	3210	2982	3096	539	929	734
Soil Percent Solids						
Upper (0-10 cm)	73.9	73.0	73.5	83.4	83.0	83.2
Lower (10-20 cm)	81.0	80.8	80.9	79.5	80.9	80.2
Average (0-20 cm)	77.5	76.9	77.2	81.5	82.0	81.7
Soil Dry Bulk Density (g/cm <sup>3</sup> )						
Upper (0-10 cm)	1.320	1.340	1.330	1.390	1.280	1.335
Lower (10-20 cm)	1.480	1.530	1.505	1.590	1.570	1.580
Average (0-20 cm)	1.400	1.435	1.418	1.490	1.425	1.458

Note:

-- = no data

**Appendix A-4**

Porta PSTA Final Sampling Summary of No Substrate Treatment (PP-18)

	<b>Tank No. 21</b>		
	<b>Rep 1</b>	<b>Rep 2</b>	<b>Average</b>
<b>Soil Type</b>	<b>None</b>	<b>None</b>	<b>None</b>
<b>Tank Bottom Area (m<sup>2</sup>)</b>	<b>6</b>	<b>6</b>	<b>6</b>
<b>Water Depth (m)</b>	<b>0.31</b>	<b>0.31</b>	<b>0.31</b>
<b>Inflow Phosphorus, Water (g/m<sup>3</sup>)</b>			
TP	0.020	--	0.020
TDP	0.009	--	0.009
SRP	0.006	--	0.006
DOP	0.004	--	0.004
TPP	0.010	--	0.010
<b>Outflow Phosphorus, Water (g/m<sup>3</sup>)</b>			
TP	0.011	--	0.011
TDP	0.009	--	0.009
SRP	0.003	--	0.003
DOP	0.006	--	0.006
TPP	0.002	--	0.002
<b>Phosphorus, Water (mg/m<sup>2</sup>)</b>			
TP	3.44	--	3.44
TDP	2.82	--	2.82
SRP	0.94	--	0.94
DOP	1.88	--	1.88
TPP	0.63	--	0.63
<b>Periphyton (g DW/m<sup>2</sup>)</b>			
Floating Mat/Metaphyton	359.93	412.14	386.04
Benthic Mat	684.55	559.54	622.04
Wall Mat	135.20	139.60	137.40
Total	1179.68	1111.28	1145.48
<b>Periphyton (g wet/m<sup>2</sup>)</b>			
Floating Mat/Metaphyton	5443.33	--	5443.33
Benthic Mat	10205.00	--	10205.00
Wall Mat	2248.33	--	2248.33
Total	17896.67	--	17896.67
<b>Periphyton (g AFDW/m<sup>2</sup>)</b>			
Floating Mat/Metaphyton	94.33	104.41	99.37
Benthic Mat	181.88	139.55	160.72
Wall Mat	35.17	36.05	35.61
Total	311.39	280.02	295.70
<b>Periphyton (g ash/m<sup>2</sup>)</b>			
Floating Mat/Metaphyton	265.60	307.73	286.66
Benthic Mat	502.66	419.99	461.33
Wall Mat	100.03	103.69	101.86
Total	868.29	831.41	849.85
<b>Periphyton TP (mg/m<sup>2</sup>)</b>			
Floating Mat/Metaphyton	63.22	70.34	66.78
Benthic Mat	184.82	166.28	175.55
Wall Mat	20.98	20.98	20.98
Total	269.02	257.60	263.31

**Appendix A-4**

**Porta PSTA Final Sampling Summary of No Substrate Treatment (PP-18)**

	<b>Tank No. 21</b>		
	<b>Rep 1</b>	<b>Rep 2</b>	<b>Average</b>
<b>Soil Type</b>	<b>None</b>	<b>None</b>	<b>None</b>
<b>Tank Bottom Area (m<sup>2</sup>)</b>	<b>6</b>	<b>6</b>	<b>6</b>
<b>Water Depth (m)</b>	<b>0.31</b>	<b>0.31</b>	<b>0.31</b>
<b>Periphyton TP (mg/kg)</b>			
Floating Mat/Metaphyton	175.64	170.67	173.15
Benthic Mat	269.99	297.17	283.58
Wall Mat	155.17	150.30	152.73
Average	228.04	231.80	229.87
<b>Periphyton TIP (mg/m<sup>2</sup>)</b>			
Floating Mat/Metaphyton	16.17	18.17	17.17
Benthic Mat	33.31	23.80	28.55
Wall Mat	2.77	3.19	2.98
Total	52.25	45.16	48.71
<b>Periphyton TIP (mg/kg)</b>			
Floating Mat/Metaphyton	44.93	44.10	44.51
Benthic Mat	48.66	42.53	45.60
Wall Mat	20.48	22.84	21.66
Average	44.29	40.64	42.52
<b>Periphyton Ca (g/m<sup>2</sup>)</b>			
Floating Mat/Metaphyton	82.34	97.08	89.71
Benthic Mat	150.14	141.21	145.67
Wall Mat	32.10	34.22	33.16
Total	264.57	272.51	268.54
<b>Periphyton Ca (mg/kg)</b>			
Floating Mat/Metaphyton	228753	235556	232154
Benthic Mat	219324	252364	235844
Wall Mat	237398	245144	241271
Average	224272	245223	234435
<b>Consumers</b>			
TP (mg/m <sup>2</sup> )	5.69	--	5.69
TP (mg/kg)	1466.3	--	1466.3
Ca (g/m <sup>2</sup> )	0.767	--	0.767
Ca (mg/kg)	197518	--	197518
Wet Weight (g/m <sup>2</sup> )	24.83	--	24.83
Dry Weight (g/m <sup>2</sup> )	3.88	--	3.88
Ash Weight (g/m <sup>2</sup> )	2.55	--	2.55
AFDW Weight (g/m <sup>2</sup> )	1.33	--	1.33

**Note:**

-- = no data

**Appendix A-5**
**Porta-PSTA Final Sampling Summary of Aquamat Treatment (PP-19)**

	<b>Tank No. 22</b>		
	<b>Rep 1</b>	<b>Rep 2</b>	<b>Average</b>
<b>Soil Type</b>	<b>AquaMat</b>	<b>AquaMat</b>	<b>AquaMat</b>
<b>Tank Bottom Area (m<sup>2</sup>)</b>	<b>6</b>	<b>6</b>	<b>6</b>
<b>Water Depth (m)</b>	<b>0.33</b>	<b>0.33</b>	<b>0.33</b>
<b>Inflow Phosphorus, Water (g/m<sup>3</sup>)</b>			
TP	0.020	--	0.020
TDP	0.009	--	0.009
SRP	0.006	--	0.006
DOP	0.004	--	0.004
TPP	0.010	--	0.010
<b>Outflow Phosphorus, Water (g/m<sup>3</sup>)</b>			
TP	0.011	--	0.011
TDP	0.007	--	0.007
SRP	0.001	--	0.001
DOP	0.006	--	0.006
TPP	0.004	--	0.004
<b>Phosphorus, Water (mg/m<sup>2</sup>)</b>			
TP	3.59	--	3.59
TDP	2.29	--	2.29
SRP	0.33	--	0.33
DOP	1.96	--	1.96
TPP	1.31	--	1.31
<b>Periphyton (g DW/m<sup>2</sup>)</b>			
Floating Mat/Metaphyton	487.42	477.52	482.47
Benthic Mat	540.83	528.37	534.60
Wall Mat	185.13	220.83	202.98
Total	1213.38	1226.72	1220.05
<b>Periphyton (g wet/m<sup>2</sup>)</b>			
Floating Mat/Metaphyton	7408.33	--	7408.33
Benthic Mat	8996.67	--	8996.67
Wall Mat	4083.33	--	4083.33
Total	20488.33	--	20488.33
<b>Periphyton (g AFDW/m<sup>2</sup>)</b>			
Floating Mat/Metaphyton	127.42	126.18	126.80
Benthic Mat	130.14	128.58	129.36
Wall Mat	48.47	56.63	52.55
Total	306.03	311.40	308.72
<b>Periphyton (g ash/m<sup>2</sup>)</b>			
Floating Mat/Metaphyton	360.00	351.34	355.67
Benthic Mat	367.83	399.00	383.42
Wall Mat	136.88	163.84	150.36
Total	864.71	914.18	889.44
<b>Periphyton TP (mg/m<sup>2</sup>)</b>			
Floating Mat/Metaphyton	86.01	86.19	86.10
Benthic Mat	153.27	149.63	151.45
Wall Mat	31.98	38.19	35.08
Total	271.27	274.00	272.63



**Appendix A-5**

**Porta-PSTA Final Sampling Summary of Aquamat Treatment (PP-19)**

<b>Soil Type</b>	<b>Tank No. 22</b>		
	<b>Rep 1</b>	<b>Rep 2</b>	<b>Average</b>
<b>Tank Bottom Area (m<sup>2</sup>)</b>	<b>AquaMat</b>	<b>AquaMat</b>	<b>AquaMat</b>
<b>Water Depth (m)</b>	<b>6</b>	<b>6</b>	<b>6</b>
	<b>0.33</b>	<b>0.33</b>	<b>0.33</b>
Periphyton TP (mg/kg)			
Floating Mat/Metaphyton	176.47	180.49	178.48
Benthic Mat	283.40	283.19	283.30
Wall Mat	172.74	172.91	172.83
Average	223.56	223.36	223.46
Periphyton TIP (mg/m <sup>2</sup> )			
Floating Mat/Metaphyton	28.73	33.39	31.06
Benthic Mat	47.86	49.55	48.70
Wall Mat	9.58	7.15	8.36
Total	86.17	90.09	88.13
Periphyton TIP (mg/kg)			
Floating Mat/Metaphyton	58.95	69.93	64.44
Benthic Mat	88.49	93.78	91.13
Wall Mat	51.73	32.36	42.05
Average	71.02	73.44	72.23
Periphyton Ca (g/m <sup>2</sup> )			
Floating Mat/Metaphyton	107.63	108.99	108.31
Benthic Mat	145.57	127.34	136.46
Wall Mat	46.67	54.57	50.62
Total	299.88	290.89	295.38
Periphyton Ca (mg/kg)			
Floating Mat/Metaphyton	220812	228238	224525
Benthic Mat	269164	241003	255084
Wall Mat	252121	247097	249609
Average	247141	237131	242109
Consumers			
TP (mg/m <sup>2</sup> )	9.07	--	9.07
TP (mg/kg)	2714.5	--	2714.5
Ca (g/m <sup>2</sup> )	1.031	--	1.031
Ca (mg/kg)	308686	--	308686
Wet Weight (g/m <sup>2</sup> )	26.50	--	26.50
Dry Weight (g/m <sup>2</sup> )	3.34	--	3.34
Ash Weight (g/m <sup>2</sup> )	1.33	--	1.33
AFDW (g/m <sup>2</sup> )	2.01	--	2.01

Note:

-- = no data

# Field Data Sheets and Chain of Custody

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# CH2M HILL Chain of Custody Form PSTA

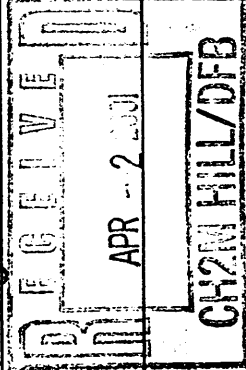
Generated on: 02/02/2001 1:53:11 PM

*Batch  
1516103  
16104, 16109*

COC Number: P247	Project: HYTON-BASED STORMWATER TREATMENT AREA (PSTA) RESEARCH AND DEMONSTRATION PR	Kit Request ID:
Project #: 148010.01.05.CH	Laboratory Coordinator: Ellen Patterson / USA 954.426.6112 x233	Lab: PPB

Sample ID	Station ID	Date & Time Collected	Matrix	Number of Containers	Analysis Requested	Comments
PP-3-BP1	PP-3-BP	02/13/01 1547	PP	1	AFDW, Ca++, DWght	20289
PP-3-BP2	PP-3-BP	02/13/01 1550	PP	1	AFDW, Ca++, DWght	490
PP-5-BP1	PP-5-BP	02/14/01 0800	PP	1	AFDW, Ca++, DWght	491
PP-5-BP2	PP-5-BP	02/14/01 0803	PP	1	AFDW, Ca++, DWght	492
PP-10-BP1	PP-10-BP	02/14/01 1350	PP	1	AFDW, Ca++, DWght	493
PP-10-BP2	PP-10-BP	02/14/01 1355	PP	1	AFDW, Ca++, DWght	494
<del>PP-14-BP1</del>						
<del>PP-14-BP2</del>						
PP-14-BP1	PP-14-BP	02/15/01 1107	PP	1	AFDW, Ca++, DWght	495
PP-14-BP2	PP-14-BP	02/15/01 1109	PP	1	AFDW, Ca++, DWght	496
PP-17-BP1	PP-17-BP	02/15/01 1210	PP	1	AFDW, Ca++, DWght	497
PP-17-BP2	PP-17-BP	02/15/01 1215	PP	1	AFDW, Ca++, DWght	498
PP-19-BP1	PP-19-BP	02/15/01 1125	PP	1	AFDW, Ca++, DWght	499
PP-19-BP2	PP-19-BP	02/15/01 1130	PP	1	AFDW, Ca++, DWght	500
PP-20-BP1	PP-20-BP	02/15/01 0943	PP	1	AFDW, Ca++, DWght	501
PP-20-BP2	PP-20-BP	02/15/01 0950	PP	1	AFDW, Ca++, DWght	502
PP-21-BP1	PP-21-BP	02/16/01 1635	PP	1	AFDW, Ca++, DWght	503
PP-21-BP2	PP-21-BP	02/16/01 1640	PP	1	AFDW, Ca++, DWght	504
PP-22-BP1	PP-22-BP	02/16/01 1525	PP	1	AFDW, Ca++, DWght	505
PP-22-BP2	PP-22-BP	02/16/01 1530	PP	1	AFDW, Ca++, DWght	506
PP-FD1-BP	PP-FD1-BP	02/16/01 0953	PP	1	AFDW, Ca++, DWght	507
PP-FD2-BP	PP-FD2-BP	02/16/01 0945	PP	1	AFDW, Ca++, DWght	508
PP-EB1-BP	PP-EB1-BP	02/14/01 1025	WQ	1	AFDW, Ca++, DWght	509
PP-EB2-BP	PP-EB2-BP	02/14/01 1026	WQ	1	AFDW, Ca++, DWght	510

Sampled By: <i>Ran</i>	Date / Time: 2/16/01 1200	Custody Seal: Y / N	Relinquished By:	Date / Time:
Shipped Via: UPS FedEx	Hand Other (please specify):			
Received By: <i>Sam</i>	Date / Time: 2/16/01 1300	Cooler Temp:	Relinquished By:	Date / Time:
Received By: <i>Amiga</i>	Date / Time: 2/16/01 1400	Cooler Temp:	Relinquished By:	Date / Time:
Remarks:				



# CH2M HILL

## Chain of Custody Form

PSTA

*Batch*  
*#16103, 16107, 16107*

Generated on: 02/02/2001 1:31:09 PM

COC Number: P247	Project: HYTON-BASED STORMWATER TREATMENT AREA (PSTA) RESEARCH AND DEMONSTRATION PR	Kit Request ID:
Project #: 148010.01.05.CH	Laboratory Coordinator: Ellen Patterson / USA 954.426.6112 x233	Lab: PPB

Sample ID	Station ID	Date & Time Collected	Matrix	Number of Containers	Analysis Requested	Comments
PP-3-FP1	PP-3-FP	02/13/01 1354	PP	1	AFDW, Ca++, DWght	202503
PP-3-FP2	PP-3-FP	02/13/01 1350	PP	1	AFDW, Ca++, DWght	504
PP-5-FP1	PP-5-FP	02/13/01 1540	PP	1	AFDW, Ca++, DWght	505
PP-5-FP2	PP-5-FP	02/13/01 1543	PP	1	AFDW, Ca++, DWght	506
PP-10-FP1	PP-10-FP	02/13/01 1010	PP	1	AFDW, Ca++, DWght	507
PP-10-FP2	PP-10-FP	02/13/01 1012	PP	1	AFDW, Ca++, DWght	508
<del>PP-10-FP3</del>	<del>PP-10-FP</del>	<del>02/13/01 1012</del>	<del>PP</del>	<del>1</del>	<del>AFDW, Ca++, DWght</del>	<del>509</del>
<del>PP-10-FP4</del>	<del>PP-10-FP</del>	<del>02/13/01 1012</del>	<del>PP</del>	<del>1</del>	<del>AFDW, Ca++, DWght</del>	<del>510</del>
PP-14-FP1	PP-14-FP	02/15/01 0925	PP	1	AFDW, Ca++, DWght	2/16/01 503
PP-14-FP2	PP-14-FP	02/15/01 0930	PP	1	AFDW, Ca++, DWght	2/16/01 510
PP-17-FP1	PP-17-FP	02/15/01 1100	PP	1	AFDW, Ca++, DWght	2/16/01 511
PP-17-FP2	PP-17-FP	02/15/01 1105	PP	1	AFDW, Ca++, DWght	2/16/01 512
PP-19-FP1	PP-19-FP	02/13/01 0930	PP	1	AFDW, Ca++, DWght	202507
PP-19-FP2	PP-19-FP	02/13/01 0937	PP	1	AFDW, Ca++, DWght	505
PP-20-FP1	PP-20-FP	02/12/01 1650	PP	1	AFDW, Ca++, DWght	506
PP-20-FP2	PP-20-FP	02/12/01 1655	PP	1	AFDW, Ca++, DWght	507
PP-21-FP1	PP-21-FP	02/12/01 1510	PP	1	AFDW, Ca++, DWght	202508
PP-21-FP2	PP-21-FP	02/12/01 1515	PP	1	AFDW, Ca++, DWght	202509
PP-22-FP1	PP-22-FP	02/12/01 1455	PP	1	AFDW, Ca++, DWght	202510
PP-22-FP2	PP-22-FP	02/12/01 1500	PP	1	AFDW, Ca++, DWght	202511
PP-FD1-FP	PP-FD1-FP	02/13/01 0939	PP	1	AFDW, Ca++, DWght	202512
PP-FD2-FP	PP-FD2-FP	02/13/01 0935	PP	1	AFDW, Ca++, DWght	202513
PP-EB1-FP	PP-EB1-FP	02/13/01 1021	WQ	1	AFDW, Ca++, DWght	202514
PP-EB2-FP	PP-EB2-FP	02/13/01 1022	WQ	1	AFDW, Ca++, DWght	202515

Sampled By: <i>Ken Ch</i>	Date / Time: 2/16/01 1230	Custody Seal: Y / N	Relinquished By:	Date / Time:
Shipped Via: UPS FedEx Hand Other (please specify):				
Received By: <i>Ellen Patterson</i>	Date / Time: 2/16/01 1300	Cooler Temp:	Relinquished By:	Date / Time:
Received By:	Date / Time:	Cooler Temp:	Relinquished By:	Date / Time:

Remarks:

CH2M HILL  
Chain of Custody Form  
PSTA

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Batch 14  
16/07/16/03,  
16/09 J

COC Number:	P247	Project:	HYTON-BASED STORMWATER TREATMENT AREA (PSTA) RESEARCH AND DEMONSTRATION PR	Kit Request ID:	
Project #:	148010.01.05.CH	Laboratory Coordinator:	Ellen Patterson / USA 954.426.6112 x233	Lab:	PPB

Sample ID	Station ID	Date & Time Collected	Matrix	Number of Containers	Analysis Requested	Comments
PP-3-WP1	PP-3-WP	02/13/01 1325	PP	1	AFDW, Cat+, DWght	202511
PP-3-WP2	PP-3-WP	02/13/01 1330	PP	1	AFDW, Cat+, DWght	576
PP-5-WP1	PP-5-WP	02/13/01 1555	PP	1	AFDW, Cat+, DWght	577
PP-5-WP2	PP-5-WP	02/13/01 1558	PP	1	AFDW, Cat+, DWght	578
PP-10-WP1	PP-10-WP	02/14/01 1100	PP	1	AFDW, Cat+, DWght	579
PP-10-WP2	PP-10-WP	02/14/01 1105	PP	1	AFDW, Cat+, DWght	520
PP-12-WP1	PP-12-WP	02/14/01 1330	PP	1	AFDW, Cat+, DWght	511
PP-12-WP2	PP-12-WP	02/14/01 1330	PP	1	AFDW, Cat+, DWght	522
PP-14-WP1	PP-14-WP	02/15/01 0945	PP	1	AFDW, Cat+, DWght	523
PP-14-WP2	PP-14-WP	02/15/01 0950	PP	1	AFDW, Cat+, DWght	524
PP-17-WP1	PP-17-WP	02/15/01 1205	PP	1	AFDW, Cat+, DWght	525
PP-17-WP2	PP-17-WP	02/15/01 1205	PP	1	AFDW, Cat+, DWght	526
PP-19-WP1	PP-19-WP	02/16/01 1055	PP	1	AFDW, Cat+, DWght	527
PP-19-WP2	PP-19-WP	02/16/01 1100	PP	1	AFDW, Cat+, DWght	528
PP-20-WP1	PP-20-WP	02/16/01 1000	PP	1	AFDW, Cat+, DWght	21610 sample 529 21610 sample 530 21610 sample 531
PP-20-WP2	PP-20-WP	02/16/01 1005	PP	1	AFDW, Cat+, DWght	21610 sample 532
PP-21-WP1	PP-21-WP	02/16/01 1545	PP	1	AFDW, Cat+, DWght	21610 sample 533
PP-21-WP2	PP-21-WP	02/16/01 1550	PP	1	AFDW, Cat+, DWght	21610 sample 534
PP-22-WP1	PP-22-WP	02/16/01 1600	PP	1	AFDW, Cat+, DWght	21610 sample 535
PP-22-WP2	PP-22-WP	02/16/01 1605	PP	1	AFDW, Cat+, DWght	21610 sample 536
PP-FD1-WP	PP-FD1-WP	02/16/01 1607	PP	1	AFDW, Cat+, DWght	21610 sample 537
PP-FD2-WP	PP-FD2-WP	02/16/01 1555	PP	1	AFDW, Cat+, DWght	21610 sample 538
PP-EB1-WP	PP-EB1-WP	02/16/01 1323	WQ	1	AFDW, Cat+, DWght	21610 sample 539
PP-EB2-WP	PP-EB2-WP	02/16/01 1324	WQ	1	AFDW, Cat+, DWght	21610 sample 540

Sampled By:	Date / Time:	2/16/01 1200	Custody Seal: Y / N	Relinquished By:	Date / Time:
Shipped Via:	UPS FedEx Hand Other (please specify):				
Received By:	Date / Time:	2/16/01 1700	Cooler Temp:	Relinquished By:	Date / Time:
Received By:	Date / Time:		Cooler Temp:	Relinquished By:	Date / Time:

Remarks:

CH2M HILL  
Chain of Custody Form  
PSTA

FEBRUARY 12, 2001 PSTA DESTRUCTIVE SAMPLING EVENT - CON

COC Number: P260 Project: HYTON-BASED STORMWATER TREATMENT AREA (PSTA) RESEARCH AND DEMONSTRATION PR Kit Request ID:   
Project #: 148010.01.05.CH Laboratory Coordinator: Ellen Patterson / USA 954.426.6112 x233 Lab: PPB

Sample ID	Station ID	Date & Time Collected	Matrix	Number of Containers	Analysis Requested	Comments
PP-3-CON	PP-3-CON	02/15/01 1430	FT	1	AFDW, Ca++, DWght	202533
PP-5-CON	PP-5-CON	02/15/01 1320	FT	1	AFDW, Ca++, DWght	534
PP-10-CON	PP-10-CON	02/15/01 1445	FT	1	AFDW, Ca++, DWght	535
PP-12-CON	PP-12-CON	02/15/01 1510	FT	1	AFDW, Ca++, DWght	536
PP-14-CON	PP-14-CON	02/15/01 1525	FT	1	AFDW, Ca++, DWght	537
PP-17-CON	PP-17-CON	02/15/01 1320	FT	1	AFDW, Ca++, DWght	538
PP-19-CON	PP-19-CON	02/15/01 1300	FT	1	AFDW, Ca++, DWght	539
PP-20-CON	PP-20-CON	02/15/01 1310	FT	1	AFDW, Ca++, DWght	540
PP-21-CON	PP-21-CON	02/12/01 - 1535	FT	1	AFDW, Ca++, DWght	541
PP-22-CON	PP-22-CON	02/15/01 - 1635	FT	1	AFDW, Ca++, DWght	542
PP-FD1-CON	PP-FD1-CON	02/15/01 1512	FT	1	AFDW, Ca++, DWght	543

Sampled By: *[Signature]* Date / Time: 2/16/01 1200 Relinquished By: Date / Time:   
Shipped Via: UPS FedEx Hand Other (please specify):   
Received By: *[Signature]* Date / Time: 2/16/01 1300 Cooler Temp:   
Received By: *[Signature]* Date / Time: 2/16/01 0900 Cooler Temp:   
Remarks:

# CH2M HILL

## Chain of Custody Form

### PSTA

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COC Number:	P247	Project:	HYTON-BASED STORMWATER TREATMENT AREA (PSTA) RESEARCH AND DEMONSTRATION PR	Kit Request ID:	
Project #:	148010.01.05.CH	Laboratory Coordinator:	Ellen Patterson / USA 954.426.6112 x233	Lab:	PPB

Sample ID	Station ID	Date & Time Collected	Matrix	Number of Containers	Analysis Requested	Comments
PP-3-UPR1	PP-3-UPR	02/14/01 0815	PP	2	PSOLIDS, BD, Cat++	202544
PP-3-UPR2	PP-3-UPR	02/14/01 0818	PP	2	PSOLIDS, BD, Cat++	10 Sample 545
PP-5-UPR1	PP-5-UPR	02/14/01 1040	PP	2	PSOLIDS, BD, Cat++	546
PP-5-UPR2	PP-5-UPR	02/14/01 1042	PP	2	PSOLIDS, BD, Cat++	547
PP-10-UPR1	PP-10-UPR	02/14/01 1530	PP	2	PSOLIDS, BD, Cat++	548
PP-10-UPR2	PP-10-UPR	02/14/01 1535	PP	2	PSOLIDS, BD, Cat++	549
PP-12-UPR1	PP-12-UPR	02/14/01 1740	PP	2	PSOLIDS, BD, Cat++	550
PP-12-UPR2	PP-12-UPR	02/14/01 1745	PP	2	PSOLIDS, BD, Cat++	551
PP-14-UPR1	PP-14-UPR	02/15/01 1315	PP	2	PSOLIDS, BD, Cat++	552
PP-14-UPR2	PP-14-UPR	02/15/01 1317	PP	2	PSOLIDS, BD, Cat++	553
PP-17-UPR1	PP-17-UPR	02/15/01 1435	PP	2	PSOLIDS, BD, Cat++	554
PP-17-UPR2	PP-17-UPR	02/15/01 1437	PP	2	PSOLIDS, BD, Cat++	555
PP-19-UPR1	PP-19-UPR	02/15/01 1355	PP	2	PSOLIDS, BD, Cat++	556
PP-19-UPR2	PP-19-UPR	02/15/01 1400	PP	2	PSOLIDS, BD, Cat++	557
PP-20-UPR1	PP-20-UPR	02/15/01 1030	PP	2	PSOLIDS, BD, Cat++	558
PP-20-UPR2	PP-20-UPR	02/15/01 1035	PP	2	PSOLIDS, BD, Cat++	559
PP-FD1-UPR	PP-FD1-UPR	02/15/01 1407	PP	2	PSOLIDS, BD, Cat++	560
PP-FD2-UPR	PP-FD2-UPR	02/15/01 0825	PP	2	PSOLIDS, BD, Cat++	561
PP-EB1-UPR	PP-EB1-UPR	02/14/01 1155	WQ	1	Cat++	202562
PP-EB2-UPR	PP-EB2-UPR	02/14/01 1156	WQ	1	Cat++	563
PP-EB2-UPR	PP-EB2-UPR	02/14/01 1156	WQ	1	Cat++	

Sampled By:	Date / Time:	2/16/01 1200	Custody Seal: Y / N	Relinquished By:	Date / Time:
Shipped Via:	UPS FedEx Hand Other (please spec. y):				
Received By:	Date / Time:	2/16/01 1300	Cooler Temp:		
Received By:	Date / Time:	2/16/01 1300	Cooler Temp:		
Remarks:					

CH2M HILL  
Chain of Custody Form

PSTA

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COC Number:

P247

Project:

HYTON-BASED STORMWATER TREATMENT AREA (PSTA) RESEARCH AND DEMONSTRATION PR

Project #:

148010.01.05.CH

Laboratory Coordinator:

Ellen Patterson / USA 954.426.6112 x233

Kit Request ID:

Lab:

PPB

Sample ID	Station ID	Date & Time Collected	Matrix	Number of Containers	Analysis Requested	Comments
PP-3-LWR1	PP-3-LWR	02/14/01	PP	2	CA_S, PSOLIDS, BD	202537
PP-3-LWR2	PP-3-LWR	02/14/01	PP	2	CA_S, PSOLIDS, BD	202537
PP-5-LWR1	PP-5-LWR	02/14/01	PP	2	CA_S, PSOLIDS, BD	202537
PP-5-LWR2	PP-5-LWR	02/14/01	PP	2	CA_S, PSOLIDS, BD	202537
PP-10-LWR1	PP-10-LWR	02/14/01	PP	2	CA_S, PSOLIDS, BD	202537
PP-10-LWR2	PP-10-LWR	02/14/01	PP	2	CA_S, PSOLIDS, BD	202537
PP-12-LWR1	PP-12-LWR	02/14/01	PP	2	CA_S, PSOLIDS, BD	202537
PP-12-LWR2	PP-12-LWR	02/14/01	PP	2	CA_S, PSOLIDS, BD	202537
PP-14-LWR1	PP-14-LWR	02/14/01	PP	2	CA_S, PSOLIDS, BD	202537
PP-14-LWR2	PP-14-LWR	02/14/01	PP	2	CA_S, PSOLIDS, BD	202537
PP-17-LWR1	PP-17-LWR	02/14/01	PP	2	CA_S, PSOLIDS, BD	202537
PP-17-LWR2	PP-17-LWR	02/14/01	PP	2	CA_S, PSOLIDS, BD	202537
PP-19-LWR1	PP-19-LWR	02/14/01	PP	2	CA_S, PSOLIDS, BD	202537
PP-19-LWR2	PP-19-LWR	02/14/01	PP	2	CA_S, PSOLIDS, BD	202537
PP-20-LWR1	PP-20-LWR	02/14/01	PP	2	CA_S, PSOLIDS, BD	202537
PP-20-LWR2	PP-20-LWR	02/14/01	PP	2	CA_S, PSOLIDS, BD	202537
PP-FD1-LWR	PP-FD1-LWR	02/14/01	PP	2	CA_S, PSOLIDS, BD	202537
PP-FD2-LWR	PP-FD2-LWR	02/14/01	PP	2	CA_S, PSOLIDS, BD	202537
PP-FD3-LWR	PP-FD3-LWR	02/14/01	PP	2	CA_S, PSOLIDS, BD	202537

Sampled By:	Date / Time: 2/16/01 12:00	Custody Seal: Y / N	Relinquished By:	Date / Time:
Shipped Via:	UPS FedEx Hand Other (please specify):			
Received By:	Date / Time: 2/16/01 12:00	Cooler Temp:	Relinquished By:	Date / Time:
Received By:	Date / Time:	Cooler Temp:	Relinquished By:	Date / Time:
Remarks:				



CH2M HILL

## Chain of Custody Form

PSTA

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20612

TWE/BK

COC Number:

P256

Project:

148010.01.05.CH

Laboratory Coordinator:

Ellen Patterson / USA 954.426.6112 x233

Kit Request ID:

Lab:

PPB

Sample ID	Station ID	Date & Time Collected	Matrix	Number of Containers	Analysis Requested	Comments
PP-3-MAC1	PP-3-MAC	02/14/01 1233	MC	1	AFDW, Ca++, DWght	202619
PP-3-MAC2	PP-3-MAC	02/14/01 1233	MC	1	AFDW, Ca++, DWght	620
PP-5-MAC1	PP-5-MAC	02/14/01 1405	MC	1	AFDW, Ca++, DWght	621
PP-5-MAC2	PP-5-MAC	02/14/01 1405	MC	1	AFDW, Ca++, DWght	622
PP-10-MAC1	PP-10-MAC	02/14/01 1651	MC	1	AFDW, Ca++, DWght	623
PP-10-MAC2	PP-10-MAC	02/14/01 1651	MC	1	AFDW, Ca++, DWght	624
PP-12-MAC1	PP-12-MAC	02/15/01 0855	MC	1	AFDW, Ca++, DWght	625
PP-12-MAC2	PP-12-MAC	02/15/01 0855	MC	1	AFDW, Ca++, DWght	626
PP-14-MAC1	PP-14-MAC	02/15/01 1620	MC	1	AFDW, Ca++, DWght	27
PP-14-MAC2	PP-14-MAC	02/15/01 1620	MC	1	AFDW, Ca++, DWght	28
PP-17-MAC1	PP-17-MAC	02/15/01 1650	MC	1	AFDW, Ca++, DWght	29
PP-17-MAC2	PP-17-MAC	02/15/01 1650	MC	1	AFDW, Ca++, DWght	30
PP-19-MAC1	PP-19-MAC	02/15/01 0850	MC	1	AFDW, Ca++, DWght	31
PP-19-MAC2	PP-19-MAC	02/15/01 0855	MC	1	AFDW, Ca++, DWght	32
PP-20-MAC1	PP-20-MAC	02/15/01 1156	MC	1	AFDW, Ca++, DWght	33
PP-20-MAC2	PP-20-MAC	02/15/01 1150	MC	1	AFDW, Ca++, DWght	34
PP-FD1-MAC	PP-FD1-MAC	02/14/01 0902	MC	1	AFDW, Ca++, DWght	35
PP-FD2-MAC	PP-FD2-MAC	02/14/01 1233	MC	1	AFDW, Ca++, DWght	36

Sampled By: <i>[Signature]</i>	Date / Time: 2/14/01 1200	Custody Seal: Y / N	Relinquished By:	Date / Time:
Shipped Via: UPS FedEx Hand Other (please specify):				
Received By: <i>[Signature]</i>	Date / Time: 2/16/01 1200	Cooler Temp:	Relinquished By:	Date / Time:
Received By:	Date / Time:	Cooler Temp:	Relinquished By:	Date / Time:
Remarks:				

## CH2M HILL

## Chain of Custody Form

PSTA

Generated on: 02/02/2001 4:42:29 PM

COC Number: P258	Project: HYTON-BASED STORMWATER TREATMENT AREA (PSTA) RESEARCH AND DEMONSTRATION PR	Kit Request ID:
Project #: 148010.01.05.CH	Laboratory Coordinator: Ellen Patterson / USA 954.426.6112 x233	Lab: PPB

Sample ID	Station ID	Date & Time Collected	Matrix	Number of Containers	Analysis Requested	Comments
PP-3-RTS1	PP-3-RTS	02/14/01 12:33	MC	1	AFDW, Ca++, DWght	202637
PP-3-RTS2	PP-3-RTS	02/14/01 12:33	MC	1	AFDW, Ca++, DWght	38
PP-5-RTS1	PP-5-RTS	02/14/01 14:15	MC	1	AFDW, Ca++, DWght	39
PP-5-RTS2	PP-5-RTS	02/14/01 14:15	MC	1	AFDW, Ca++, DWght	40
PP-10-RTS1	PP-10-RTS	02/14/01 17:00	MC	1	AFDW, Ca++, DWght	41
PP-10-RTS2	PP-10-RTS	02/14/01 17:00	MC	1	AFDW, Ca++, DWght	42
PP-12-RTS1	PP-12-RTS	02/15/01 09:00	MC	1	AFDW, Ca++, DWght	43
PP-12-RTS2	PP-12-RTS	02/15/01 09:00	MC	1	AFDW, Ca++, DWght	44
PP-14-RTS1	PP-14-RTS	02/15/01 16:30	MC	1	AFDW, Ca++, DWght	45
PP-14-RTS2	PP-14-RTS	02/15/01 16:30	MC	1	AFDW, Ca++, DWght	46
PP-17-RTS1	PP-17-RTS	02/15/01 17:00	MC	1	AFDW, Ca++, DWght	47
PP-17-RTS2	PP-17-RTS	02/15/01 17:00	MC	1	AFDW, Ca++, DWght	48
PP-19-RTS1	PP-19-RTS	02/14/01 09:05	MC	1	AFDW, Ca++, DWght	49
PP-19-RTS2	PP-19-RTS	02/14/01 09:10	MC	1	AFDW, Ca++, DWght	50
PP-20-RTS1	PP-20-RTS	02/13/01 11:55	MC	1	AFDW, Ca++, DWght	51
PP-20-RTS2	PP-20-RTS	02/13/01 11:55	MC	1	AFDW, Ca++, DWght	52
PP-FD1-RTS	PP-FD1-RTS	02/14/01 09:15	MC	1	AFDW, Ca++, DWght	53
PP-FD2-RTS	PP-FD2-RTS	02/14/01 12:33	MC	1	AFDW, Ca++, DWght	54

Sampled By: <i>[Signature]</i>	Date / Time: 2/16/01 12:00	Custody Seal: Y / N	Relinquished By:	Date / Time:
Shipped Via: UPS FedEx Hand Other (please specify):				
Received By: <i>[Signature]</i>	Date / Time: 2/16/01 13:00	Cooler Temp:	Relinquished By:	Date / Time:
Received By:	Date / Time:	Cooler Temp:	Relinquished By:	Date / Time:
Remarks:				

**Destructive Sampling Field Sheet**  
**Porta-PSTA Cell Monitoring**  
**Periphyton-Based Stormwater Treatment Area (PSTA) Project**

148010.P2.06.CH

Porta-PSTA 3 5 10 12 14 17 19 20 21 22

Staff Gauge (in): \_\_\_\_\_

Field Team: \_\_\_\_\_

Date/Time: \_\_\_\_\_

<u>Periphyton:</u>	<u>Floating/</u> <u>Metaphyton</u>	<u>Wall</u>	<u>Benthic</u>	<u>EndWall</u> <u>Periphyton</u>
Total Volume (units):	28.01 L 30.62 kg / 21.77 L	10.32 kg / 21.77 L	52.16 kg / 49.24 L	
<u>Vol. Subsample 1 (units):</u>	700 ml	660	720	Inflow: 255 245 230
Vol. DI added (mls):	300	340	280	40 30 30
Total Vol. Subsample 1:	1000	1000	1000	Outflow: 295 275 260
<u>Vol. Subsample 2 (units):</u>	660	295	740	
Vol. DI added (mls):	340	705	260	Outflow: 300 230 140
Total Vol. Subsample 2:	1000	1000	1000	40 20 40
Field Duplicate:		4000		340 250 180

<u>Macrophytes:</u>	<u>Above Ground Portion (g)</u>		<u>Total Wet</u> <u>WT = 14.52 kg</u>	<u>Below Ground Portion (g)</u>	
	<u>Empty</u> <u>Container</u>	<u>Container</u> <u>and sample</u>	<u>Sample</u>	<u>Empty</u> <u>Container</u>	<u>Container</u> <u>and sample</u>
<u>Total Weight (Wet)</u>	2	416 13.502	216 13.502	2	316 11.02
<u>Wt. Subsample 1:</u>	12	89	77 g	12	79
<u>Wt. Subsample 2:</u>	12	98	86 g	12	80
<u>Field Duplicates:</u>	12 FD2	80	68 g	FD2	131

<u>Species Present</u>	<u>Percent</u>	<u>Species Present</u>	<u>Percent</u>	<u>Species Present</u>	<u>Percent</u>
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

<u>Animals:</u>	<u>Species</u>	<u>No. Individuals</u>	<u>Total Weight (g)</u>
<u>Fish</u>	_____	_____	_____
<u>Snails</u>	Helisoma	131	Empty Container
	Physa	2-31 D-3	Container and sample
<u>Others</u>	_____	2-8 16	Sample (total)
			0.091 kg / 0.10 L
			Total Volume (units)

<u>Sediment*:</u>	<u>0-10cm Sample 1</u> <u>Total Weight (g)</u>	<u>0-10cm Sample 2</u> <u>Total Weight (g)</u>	<u>10-20cm Sample 1</u> <u>Total Weight (g)</u>	<u>10-20cm Sample 2</u> <u>Total Weight (g)</u>
<u>Empty Container</u>	_____	_____	_____	_____
<u>Container and sample</u>	_____	_____	_____	_____
<u>Sample (Total)</u>	3.54 kg / 20 L	_____	6.03 kg / 3.1 L	_____
<u>Total Volume (units)</u>	FD2 UPR	_____	FD2 UPR	_____
	<u>Field Dup Sample</u> <u>Total Weight (g)</u>		<u>Horizon Marker</u> <u>Total Weight (g)</u>	<u>Horiz. Marker Dup</u> <u>Total Weight (g)</u>
<u>Empty Container</u>	_____		_____	_____
<u>Container and sample</u>	_____		_____	_____
<u>Sample</u>	_____		_____	_____
<u>Total Volume (units)</u>	_____		_____	_____

\* Compositd sample from 10 locations: 3 locations from North zone, 4 locations from Center zone, 3 locations from South zone.

Comments: T&R MAC 31g T&R TP RTs 42g  
 TP MAC 30g TP RTs 44g  
 Signature: FD2 MAC 23g FD2 RTs 48g

**Staff**  
**Gauge (in):** \_\_\_\_\_

Date/Time: 2-13-01

<u>Macrophytes:</u>			<u>Above Ground Portion (g)</u>			<u>Below Ground Portion (g)</u>		
	<u>Empty Container</u>	<u>Container and sample</u>	<u>Sample</u>	<u>Empty Container</u>	<u>Container and sample</u>	<u>Sample</u>		
Total Weight (Wet)	2.3 lbs	6 lbs. 8 oz	4 lbs. 3.2 oz	2.3 lbs.	3 lbs 5 1/2 oz	1 lb 0.7 oz		
Wt. Subsample 1:	12.8 g	110	98g	12	138g	126g		
Wt. Subsample 2:	↓	98	86g	↓	91g	79g		
Field Duplicates:	↓							
Total Wt Wet	6.46 lbs							
<u>Species Present</u>	<u>Percent</u>	<u>Species Present</u>	<u>Percent</u>	<u>Species Present</u>	<u>Percent</u>	<u>Species Present</u>	<u>Percent</u>	

<b><u>Animals:</u></b>	<b><u>Species</u></b>	<b><u>No. Individuals</u></b>		<b><u>Total Weight (g)</u></b>
<b><u>Fish</u></b>	Tadpole	1		
Other	Damselfly nymph	3	Empty Container	_____
	Dragonfly nymph	4	Container and sample	_____
<b><u>Snails</u></b>	Helisoma	67	Sample	_____
	Physa	5		
<b><u>Others</u></b>			<b>Total Volume (units)</b>	0.031 kg / 0.03 L

<b><u>Sediment*:</u></b>				
	<b><u>0-10cm Sample 1</u></b>	<b><u>0-10cm Sample 2</u></b>	<b><u>10-20cm Sample 1</u></b>	<b><u>10-20cm Sample 2</u></b>
	<b><u>Total Weight (g)</u></b>	<b><u>Total Weight (g)</u></b>	<b><u>Total Weight (g)</u></b>	<b><u>Total Weight (g)</u></b>
Empty Container	_____	_____	_____	_____
Container and sample	_____	_____	_____	_____
Sample	_____	_____	_____	_____
<b><u>Total Volume (units)</u></b>	3.18 kg / 2.0 L	_____	4.20 kg / 2.2 L	_____
	<b><u>Field Dup Sample</u></b>		<b><u>Horizon Marker</u></b>	<b><u>Horiz.Marker Dup</u></b>
	<b><u>Total Weight (g)</u></b>		<b><u>Total Weight (g)</u></b>	<b><u>Total Weight (g)</u></b>
Empty Container	_____		_____	_____
Container and sample	_____		_____	_____
Sample	_____		_____	_____
<b><u>Total Volume (units)</u></b>				

\* Compositd sample from 10 locations: 3 locations from North zone, 4 locations from Center zone, 3 locations from South zone.

Comments: T.P/TP Max ~~38g~~ 38g TP ~~44g~~ 44g TP ~~47g~~ 47g TP ~~50g~~ 50g

# **Destructive Sampling Field Sheet** **Porta-PSTA Cell Monitoring** **Periphyton-Based Stormwater Treatment Area (PSTA) Project**

148010.P2.06.CH

Porta-PSTA      3      5      10      12      14      17      19      20      21      22      Staff Gauge (in): \_\_\_\_\_

Field Team: \_\_\_\_\_  
 Date/Time: 02.14.01

<u>Periphyton:</u>	<u>Floating/ Metaphyton</u>	<u>Wall</u>	<u>Benthic</u>	<u>EndWall Periphyton</u>
Total Volume (units):	20.48 L / 20.06 L	17.60 L / 17.03 L	40.37 L / 38.23 L	
<u>Vol. Subsample 1 (units):</u>	<u>702</u>	<u>706</u>	<u>697</u>	Inflow: <u>Ⓐ</u> <u>Ⓑ</u> <u>Ⓒ</u>
Vol. DI added (mls):	<u>298</u>	<u>294</u>	<u>303</u>	<u>290</u> <u>262</u> <u>208</u>
Total Vol. Subsample 1:	<u>1000</u>	<u>1000</u>	<u>1000</u>	Outflow: _____
<u>Vol. Subsample 2 (units):</u>	<u>699</u>	<u>690</u>	<u>695</u>	
Vol. DI added (mls):	<u>301</u>	<u>310</u>	<u>305</u>	<u>Outflow</u> <u>225</u> <u>273</u> <u>262</u>
Total Vol. Subsample 2:	<u>1000</u>	<u>1000</u>	<u>1000</u>	
Field Duplicate:	_____	_____	_____	

<u>Macrophytes:</u>	<u>Above Ground Portion (g)</u>			<u>Below Ground Portion (g)</u>		
	<u>Empty Container</u>	<u>Container and sample</u>	<u>Sample</u>	<u>Empty Container</u>	<u>Container and sample</u>	<u>Sample</u>
Total Weight (Wet)	<u>2.01b</u>	<u>5.161b</u>	_____	<u>2.31b</u>	<u>4.01b</u>	_____
Wt. Subsample 1:	<u>12g</u>	<u>78</u>	_____	<u>12</u>	<u>124.01b</u>	_____
Wt. Subsample 2:	<u>12g</u>	<u>78</u>	_____	<u>12</u>	<u>224</u>	_____
Field Duplicates:	_____	_____	_____	_____	_____	_____
Total Wt. Collected	<u>20.73 kg</u>	<u>Process: 3.04 kg</u>				
<u>Species Present</u>	<u>Percent</u>	<u>Species Present</u>	<u>Percent</u>	<u>Species Present</u>	<u>Percent</u>	<u>Percent</u>
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____

<u>Animals:</u>	<u>Species</u>	<u>No. Individuals</u>	<u>Total Weight (g)</u>
<u>Fish</u>	<u>'Stripe' fish</u>	<u>4</u>	_____
<u>Other</u>	<u>Dragon nymph</u>	<u>1</u>	_____
	<u>Burle larvae</u>	<u>1</u>	_____
<u>Snails</u>	<u>Helisoma</u>	<u>100</u>	_____
	<u>Physa</u>	<u>3</u>	_____
<u>Others</u>	_____	_____	_____
Total Volume (units)			<u>0.101 kg / 0.09 L</u>

<u>Sediment*:</u>	<u>0-10cm Sample 1</u>	<u>0-10cm Sample 2</u>	<u>10-20cm Sample 1</u>	<u>10-20cm Sample 2</u>
	<u>Total Weight (g)</u>	<u>Total Weight (g)</u>	<u>Total Weight (g)</u>	<u>Total Weight (g)</u>
Empty Container	_____	_____	_____	_____
Container and sample	_____	_____	_____	_____
Sample	_____	_____	_____	_____
Total Volume (units)	<u>0.02 kg / 5.02</u>	_____	<u>FD3 LWR</u>	_____
			<u>10.66 kg / 5.5 L</u>	<u>Total Wt.</u>
	<u>Field Dup Sample</u>		<u>Horizon Marker</u>	<u>Horiz. Marker Dup</u>
	<u>Total Weight (g)</u>		<u>Total Weight (g)</u>	<u>Total Weight (g)</u>
Empty Container	_____		_____	_____
Container and sample	_____		_____	_____
Sample	_____		_____	_____
Total Volume (units)	_____		_____	_____

\* Compositd sample from 10 locations: 3 locations from North zone, 4 locations from Center zone, 3 locations from South zone.  
an sample + container (37g)  
 Comments: P2-0727 wt 77g Tip, TP 10 mac P2-0728 wt 90g TP 10 mac  
P2-0746 wt 81g TP 10S P2-0745 wt 102g Tip TP 10RTS  
 Signature: \_\_\_\_\_

# Destructive Sampling Field Sheet

## Porta-PSTA Cell Monitoring

### Periphyton-Based Stormwater Treatment Area (PSTA) Project

148010.P2.06.CH

 Porta-PSTA      3      5      10      12      14      17      19      20      21      22

 Staff  
 Gauge (in): \_\_\_\_\_

Field Team: \_\_\_\_\_

Date/Time: 2-14-01

<u>Periphyton:</u>	<u>Floating/ Metaphyton</u>	<u>Wall</u>	<u>Benthic</u>	<u>EndWall Periphyton</u>
Total Volume (units):	-	0.293 kg / 0.413 L	-	(A)      (B)      (C)
<u>Vol. Subsample 1 (units):</u>	NP	299*	NP	Inflow: <del>385</del> 450 483
Vol. DI added (mls):	-	1300	-	592
Total Vol. Subsample 1:	-	1599	-	Outflow: _____
<u>Vol. Subsample 2 (units):</u>	NP	*	NP	outflow: 569 480 404
Vol. DI added (mls):	-	1 sample split for sub 1 + 2	-	
Total Vol. Subsample 2:	-	-	-	
Field Duplicate:	-	-	-	

<u>Macrophytes:</u>	<u>Above Ground Portion (g)</u>			<u>Below Ground Portion (g)</u>		
	<u>Empty Container</u>	<u>Container and sample</u>	<u>Sample</u>	<u>Empty Container</u>	<u>Container and sample</u>	<u>Sample</u>
Total Weight (Wet)	216.82g	516.82g	316.82g	116.14g	316.90g	1216.11g
Wt. Subsample 1:	12g	96g	84g	-	100g	88g
Wt. Subsample 2:	12g	114g	102g	-	139g	129g
Field Duplicates:	-	-	-	-	-	-
Total Wt: 21.72 kg      Rows: 2.69 kg.						
<u>Species Present</u>	<u>Percent</u>	<u>Species Present</u>	<u>Percent</u>	<u>Species Present</u>	<u>Percent</u>	<u>Percent</u>
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____

<u>Animals:</u>	<u>Species</u>	<u>No. Individuals</u>	<u>Total Weight (g)</u>
<u>Fish</u>	Striped Fish	1	
	Crayfish	20	
	Benthic larvae	1	
<u>Snails</u>	Helisoma	135	
	Physa	1	
<u>Others</u>	_____	_____	
			Empty Container _____
			Container and sample _____
			Sample _____
			Total Volume (units) <u>FDI-CON</u> 0.281 kg, 10.29 L

	<u>0-10cm Sample 1</u>	<u>0-10cm Sample 2</u>	<u>10-20cm Sample 1</u>	<u>10-20cm Sample 2</u>
	<u>Total Weight (g)</u>	<u>Total Weight (g)</u>	<u>Total Weight (g)</u>	<u>Total Weight (g)</u>
Empty Container	_____	_____	_____	_____
Container and sample	_____	_____	_____	_____
Sample	_____	_____	_____	_____
Total Volume (units)	3.12 kg / 2.8 L	_____	1.99 kg / 1.9 L	_____
	<u>Field Dup Sample</u>		<u>Horizon Marker</u>	<u>Horiz. Marker Dup</u>
	<u>Total Weight (g)</u>		<u>Total Weight (g)</u>	<u>Total Weight (g)</u>
Empty Container	_____		_____	_____
Container and sample	_____		_____	_____
Sample	_____		_____	_____
Total Volume (units)	_____		_____	_____

\* Composited sample from 10 locations: 3 locations from North zone, 4 locations from Center zone, 3 locations from South zone.

 Comments: TIP / TP MAC 51g      TIP / TP RTS 30g  
TP MAC 30g      TP RTS 28g

Signature: \_\_\_\_\_

**Destructive Sampling Field Sheet**  
**Porta-PSTA Cell Monitoring**  
**Periphyton-Based Stormwater Treatment Area (PSTA) Project**

148010.P2.06.CH

Porta-PSTA      3      5      10      12      14      17      19      20      21      22      Staff Gauge (in): \_\_\_\_\_

Field Team: \_\_\_\_\_  
 Date/Time: 2-14-01

<u>Periphyton:</u>	<u>Floating/ Metaphyton</u>	<u>Wall</u>	<u>Benthic</u>	<u>EndWall Periphyton</u>
Total Volume (units):	<u>9.14 kg / 9.46 L</u>	<u>2.76 kg / 2.70 L</u>	<u>18.51 kg / 18.55 L</u>	
<u>Vol. Subsample 1 (units):</u>	<u>619</u>	<u>358</u>	<u>371</u>	Inflow: <u>301</u> <u>240</u> <u>309</u>
Vol. DI added (mls):	<u>381</u>	<u>242</u>	<u>229</u>	Outflow: <u>301</u>
Total Vol. Subsample 1:	<u>1000</u>	<u>1000</u>	<u>1000</u>	
<u>Vol. Subsample 2 (units):</u>	<u>552</u>	<u>720</u>	<u>742</u>	
Vol. DI added (mls):	<u>448</u>	<u>280</u>	<u>258</u>	
Total Vol. Subsample 2:	<u>1000</u>	<u>1000</u>	<u>1000</u>	OUT: <u>490</u> <u>461</u> <u>489</u>
Field Duplicate:				<u>301</u> <u>491</u>

<u>Macrophytes:</u>	<u>Above Ground Portion (g)</u>			<u>Below Ground Portion (g)</u>		
	<u>Empty Container</u>	<u>Container and sample</u>	<u>Sample</u>	<u>Empty Container</u>	<u>Container and sample</u>	<u>Sample</u>
Total Weight (Wet)	<u>216</u>	<u>516 402</u>	<u>316 402</u>	<u>216</u>	<u>316 1302</u>	<u>116 1302</u>
Wt. Subsample 1:	<u>12</u>	<u>135</u>	<u>123 g</u>	<u>12</u>	<u>145</u>	<u>133 g</u>
Wt. Subsample 2:	<u>1</u>	<u>196</u>	<u>184 g</u>		<u>156</u>	<u>144 g</u>
Field Duplicates:						
<u>Species Present</u>	<u>Percent</u>	<u>Species Present</u>	<u>Percent</u>	<u>Species Present</u>	<u>Percent</u>	<u>Percent</u>

<u>Animals:</u>	<u>Species</u>	<u>No. Individuals</u>	<u>Total Weight (g)</u>
<u>Fish</u>			
			Empty Container
			Container and sample
<u>Snails</u>	<u>Helisoma</u>	<u>73</u>	Sample
<u>Others</u>	<u>Dragon nymph</u>	<u>1</u>	Total Volume (units) <u>0.076 kg / 0.06 L</u>

<u>Sediment*:</u>	<u>0-10cm Sample 1</u>	<u>0-10cm Sample 2</u>	<u>10-20cm Sample 1</u>	<u>10-20cm Sample 2</u>
	<u>Total Weight (g)</u>	<u>Total Weight (g)</u>	<u>Total Weight (g)</u>	<u>Total Weight (g)</u>
Empty Container				
Container and sample				
Sample				
Total Volume (units)	<u>2.38 kg / 2.5 L</u>		<u>1.50 kg / 1.4 L</u>	
	<u>Field Dup Sample</u>		<u>Horizon Marker</u>	<u>Horiz. Marker Dup</u>
	<u>Total Weight (g)</u>		<u>Total Weight (g)</u>	<u>Total Weight (g)</u>
Empty Container				
Container and sample				
Sample				
Total Volume (units)				

\* Compositied sample from 10 locations: 3 locations from North zone, 4 locations from Center zone, 3 locations from South zone.

Comments: MAC T.P. / TP 39 g T.P. / TP 62 g  
TP 41 g TP 176 (46) g

Signature: \_\_\_\_\_

**Destructive Sampling Field Sheet**  
**Porta-PSTA Cell Monitoring**  
**Periphyton-Based Stormwater Treatment Area (PSTA) Project**

148010.P2.06.CH

Porta-PSTA      3      5      10      12      14      (17)      19      20      21      22

Staff

Gauge (in): \_\_\_\_\_

Field Team: \_\_\_\_\_

Date/Time: 02.501

<u>Periphyton:</u>	<u>Floating/ Metaphyton</u>	<u>Wall</u>	<u>Benthic</u>	<u>EndWall Periphyton</u>
Total Volume (units):	0.488 kg / 0.490 L	0.358 kg / 0.350 L	8.01 kg / 7.14 L	
<u>Vol. Subsample 1 (units):</u>	510	390	651	Inflow: 360 354 349
Vol. DI added (mls):	1000	1210	349	
Total Vol. Subsample 1:	1510	1600	1000	Outflow: _____
<u>Vol. Subsample 2 (units):</u>	*	*	700	
Vol. DI added (mls):	2 sample dilute		300	Out: 518 494 469
Total Vol. Subsample 2:	8.500		1000	
Field Duplicate:	4.500 2			

<u>Macrophytes:</u>	<u>Above Ground Portion (g)</u>			<u>Below Ground Portion (g)</u>		
Total Wt 26.05 kg	<u>Empty</u>	<u>Container</u>	<u>Sample</u>	<u>Empty</u>	<u>Container</u>	<u>Sample</u>
Procedural: 1.50 kg	<u>Container</u>	<u>and sample</u>		<u>Container</u>	<u>and sample</u>	
Total Weight (Wet)	2	416.702	216.702	216.702	216.802	802
Wt. Subsample 1:	12	145g	132g		106g	94g
Wt. Subsample 2:	↓	115g	99g		100g	88g
Field Duplicates:						

<u>Species Present</u>	<u>Percent</u>	<u>Species Present</u>	<u>Percent</u>	<u>Species Present</u>	<u>Percent</u>
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

<u>Animals:</u>	<u>Species</u>	<u>No. Individuals</u>	<u>Total Weight (g)</u>
<u>Fish</u>	Sturgeon	14	
	tail pole	3	
			Empty Container
			Container and sample
<u>Snails</u>	Helisoma	96	
	Physa	5	
			Sample
<u>Others</u>	Dragon nymph	1	
			Total Volume (units)
			0.048 10.04 L

<u>Sediment*:</u>	<u>0-10cm Sample 1</u>	<u>0-10cm Sample 2</u>	<u>10-20cm Sample 1</u>	<u>10-20cm Sample 2</u>
	<u>Total Weight (g)</u>	<u>Total Weight (g)</u>	<u>Total Weight (g)</u>	<u>Total Weight (g)</u>
Empty Container	_____	_____	_____	_____
Container and sample	_____	_____	_____	_____
Sample	_____	_____	_____	_____
Total Volume (units)	1.98 kg / 1.8 L	_____	2.09 kg / 1.9 L	_____
	<u>Field Dup Sample</u>		<u>Horizon Marker</u>	<u>Horiz. Marker Dup</u>
	<u>Total Weight (g)</u>		<u>Total Weight (g)</u>	<u>Total Weight (g)</u>
Empty Container	_____		_____	_____
Container and sample	_____		_____	_____
Sample	_____		_____	_____
Total Volume (units)	_____		_____	_____

\* Composit sample from 10 locations: 3 locations from North zone, 4 locations from Center zone, 3 locations from South zone.

 Comments: MAC I.R / T.D sample 416 RTD I.R sample 283  
TR 335 - TR 515

Signature: \_\_\_\_\_



**Destructive Sampling Field Sheet**  
**Porta-PSTA Cell Monitoring**  
**Periphyton-Based Stormwater Treatment Area (PSTA) Project**

148010.P2.06.CH

Porta-PSTA      3      5      10      12      14      17      19      20      21      22      Staff Gauge (in): \_\_\_\_\_

Field Team: \_\_\_\_\_  
 Date/Time: \_\_\_\_\_

<u>Periphyton:</u>	<u>Floating/ Metaphyton</u>	<u>Wall</u>	<u>Benthic</u>	<u>EndWall Periphyton</u>
Total Volume (units):	17.01 kg / 17.03 L	6.35 kg / 6.00 L	78.93 kg / 75.71 L	(A) (B) (C)
<u>Vol. Subsample 1 (units):</u>	755 755	728	735	Inflow: 220 250 210
Vol. DI added (mls):	1000	272	265	Outflow: 20
Total Vol. Subsample 1:	1755	1000	1000	240
<u>Vol. Subsample 2 (units):</u>	755	730	730	Aut: 170 190 165
Vol. DI added (mls):	1000	270	270	30 DI
Total Vol. Subsample 2:	1755	1000	1000	195 total
Field Duplicate:	FD2-Sub1 FD1-Sub2			

<u>Macrophytes:</u>	<u>Above Ground Portion (g)</u>			<u>Below Ground Portion (g)</u>		
Total Plant Weight 19.75 kg = 8.96 kg	<u>Empty Container</u>	<u>Container and sample</u>	<u>Sample</u>	<u>Empty Container</u>	<u>Container and sample</u>	<u>Sample</u>
Total Weight (Wet)	5	4	436 lbs.	2	6.51 lbs.	4.8
Wt. Subsample 1:	12g	118	106g	12g	134	122g
Wt. Subsample 2:	12g	120	108g	12g	139	127g
Field Duplicates:		128	FD1-MAC 116g		148	FD1-RTS 136g
Processed wt 6.15 kg.						
<u>Species Present</u>	<u>Percent</u>	<u>Species Present</u>	<u>Percent</u>	<u>Species Present</u>	<u>Percent</u>	<u>Percent</u>
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____

<u>Animals:</u>	<u>Species</u>	<u>No. Individuals</u>	<u>Total Weight (g)</u>
<u>Fish</u>	<u>Gambusia</u>	61	
	SP #1 roots	2	
	SP #2 stripe	10	
<u>Snails</u>	<u>Helisoma</u>	L-151 D-5	
<u>Others</u>			
			Empty Container
			Container and sample
			Sample
			Total Volume (units)
			0.093 kg 10.08 L

<u>Sediment*:</u>	<u>0-10cm Sample 1</u>	<u>0-10cm Sample 2</u>	<u>10-20cm Sample 1</u>	<u>10-20cm Sample 2</u>
	<u>Total Weight (g)</u>	<u>Total Weight (g)</u>	<u>Total Weight (g)</u>	<u>Total Weight (g)</u>
Empty Container				
Container and sample				
Sample				
Total Volume (units)	2.34 kg 11.42 L		2.45 kg 11.23 L	
	<u>Field Dup Sample</u>		<u>Horizon Marker</u>	<u>Horiz. Marker Dup</u>
	<u>Total Weight (g)</u>		<u>Total Weight (g)</u>	<u>Total Weight (g)</u>
Empty Container	FD1-UPR			
Container and sample				
Sample				
Total Volume (units)				

\* Compositd sample from 10 locations: 3 locations from North zone, 4 locations from Center zone, 3 locations from South zone.

Comments: TP/T.P MAC 53g      TP/T.P RTS 79g  
 Signature: TP MAC 46g      TP RTS 49g  
 SS 52g FD1 MAC      PD1 RTS

**Destructive Sampling Field Sheet**  
**Porta-PSTA Cell Monitoring**  
**Periphyton-Based Stormwater Treatment Area (PSTA) Project**

148010.P2.06.CH

Porta-PSTA      3      5      10      12      14      17      19      20      21      22      Staff Gauge (in): \_\_\_\_\_

Field Team: \_\_\_\_\_  
 Date/Time: 2/12/01

<u>Periphyton:</u>	<u>Floating/</u> <u>Metaphyton</u>	<u>Wall</u>	<u>Benthic</u>	<u>EndWall</u> <u>Periphyton</u>	<u>Total Vol</u> <u>ml</u>
Total Volume (units):	19.50 kg / 18.53 L	227 kg / 2.50 L	44.91 kg / 37.85 L		
<u>Vol. Subsample 1 (units):</u>	650	618	790	Inflow: <u>265</u>	<u>230</u> <u>275</u>
Vol. DI added (mls):	350	382	1000		
Total Vol. Subsample 1:	1000	1000	1790	Outflow: _____	
<u>Vol. Subsample 2 (units):</u>	680	665	700		
Vol. DI added (mls):	320	1000	1000	Out: <u>550</u>	<u>465</u> <u>570</u>
Total Vol. Subsample 2:	1000	1665	1700		
Field Duplicate:		FD1-Sub 2	Sub 1- FD2 Sub 2- FD1		

<u>Macrophytes:</u>	<u>Above Ground Portion (g)</u>			<u>Below Ground Portion (g)</u>		
	<u>Empty</u> <u>Container</u>	<u>Container</u> <u>and sample</u>	<u>Sample</u>	<u>Empty</u> <u>Container</u>	<u>Container</u> <u>and sample</u>	<u>Sample</u>
Total Wt: <u>6.62 kg</u>						
Total Weight (Wet)	<u>4.31 kg</u>	<u>13.5 lbs</u>	<u>9.2 lbs</u>	<u>2.0 lbs</u>	<u>9.0 lbs</u>	<u>2.0 lbs</u>
PPB Wt. Subsample 1:	<u>12 g</u>	<u>81 g</u>	<u>69 g</u>	<u>12 g</u>	<u>85 g 109</u>	<u>89 g 97 g</u>
PPB Wt. Subsample 2:	<u>12 g</u>	<u>56 g</u>	<u>44 g</u>	<u>12 g</u>	<u>85 g 147</u>	<u>49 g 135 g</u>
Field Duplicates:						

<u>Species Present</u>	<u>Percent</u>	<u>Species Present</u>	<u>Percent</u>	<u>Species Present</u>	<u>Percent</u>
<u>Elodea</u>	<u>99%</u>				
<u>Chara</u>	<u>1%</u>				

<u>Animals:</u>	<u>Species</u>	<u>No. Individuals</u>	<u>Total Weight (g)</u>
<u>Fish</u>			
			Empty Container
			Container and sample
<u>Snails</u>	<u>20 live, 45 dead</u>		Sample
<u>Others</u>	<u>1 Gambusia</u>		
<u>2 beetle larvae</u>	<u>19 Dragonfly nymph</u>		
		Total Volume (units)	<u>0.039 kg / 0.04 L</u>

<u>Sediment*:</u>	<u>0-10cm Sample 1</u> <u>Total Weight (g)</u>	<u>0-10cm Sample 2</u> <u>Total Weight (g)</u>	<u>10-20cm Sample 1</u> <u>Total Weight (g)</u>	<u>10-20cm Sample 2</u> <u>Total Weight (g)</u>
Empty Container				
Container and sample				
Sample				
Total Volume (units)	<u>4.11 kg / 2.0 L</u>		<u>FD1-LWP</u> <u>Total Wt: 4.94 kg / 2.7 L</u>	
	<u>Field Dup Sample</u> <u>Total Weight (g)</u>		<u>Horizon Marker</u> <u>Total Weight (g)</u>	<u>Horiz. Marker Dup</u> <u>Total Weight (g)</u>
Empty Container				
Container and sample				
Sample				
Total Volume (units)				

\* Composit sample from 10 locations: 3 locations from North zone, 4 locations from Center zone, 3 locations from South zone.

Comments: T.P.P. : 57g bare 38g MAC sample 19g // T.P. 64g Total 36 mac sample 34g  
T.P. : 60g total - bare 38 MAC // 22g // 78 64g // 37 mac // 275g

Signature: \_\_\_\_\_

**Destructive Sampling Field Sheet**  
**Porta-PSTA Cell Monitoring**  
**Periphyton-Based Stormwater Treatment Area (PSTA) Project**

148010.P2.06.CH

Porta-PSTA      3      5      10      12      14      17      19      20      (21)      22      Staff Gauge (in): \_\_\_\_\_

Field Team: \_\_\_\_\_  
 Date/Time: 2/12/01

<b>Periphyton:</b>	32.66 kg 34.07 L	<b>Floating/ Metaphyton</b> 72	13.49 kg Wall 13.63 L	<b>Benthic</b> 61.23 kg 61.51 L	<b>EndWall Periphyton</b>
Total Volume (units):	9 gal / 33 lbs	3.6 gal	16.25 gal		
Vol. Subsample 1 (units):	615 ml	645	800		
Vol. DI added (mls):	385	355	500		
Total Vol. Subsample 1:	1000	1000	1000		
Vol. Subsample 2 (units):	660	670	695		
Vol. DI added (mls):	340	330	305		
Total Vol. Subsample 2:	1000	1000	1000		
Field Duplicate:					

31.5 lbs      14 lbs SAMPLE + CAN 6 lbs

<b>Macrophytes:</b>	<b>Above Ground Portion (g)</b>			<b>Below Ground Portion (g)</b>		
	<b>Empty Container</b>	<b>Container and sample</b>	<b>Sample</b>	<b>Empty Container</b>	<b>Container and sample</b>	<b>Sample</b>
Total Weight (Wet)	_____	_____	_____	_____	_____	_____
Wt. Subsample 1:	_____	_____	_____	_____	_____	_____
Wt. Subsample 2:	_____	_____	_____	_____	_____	_____
Field Duplicates:	_____	_____	_____	_____	_____	_____

<b>Species Present</b>	<b>Percent</b>	<b>Species Present</b>	<b>Percent</b>	<b>Species Present</b>	<b>Percent</b>
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

<b>Animals:</b>	<b>Species</b>	<b>No. Individuals</b>	<b>Total Weight (g)</b>
<b>Fish</b>	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
<b>Snails</b>	<u>Helosoma</u>	<u>43 259</u>	_____
	_____	_____	_____
<b>Others</b>	<u>Water bug</u>	<u>1</u>	_____
	<u>Dragonfly nymph</u>	<u>1</u>	_____

Empty Container 14  
 Container and sample 163  
 Sample 149  
 Total Volume (units) 400 ml displaced vol  
 0.149 kg 10.40 L

	<b>0-10cm Sample 1</b>	<b>0-10cm Sample 2</b>	<b>10-20cm Sample 1</b>	<b>10-20cm Sample 2</b>
	<b>Total Weight (g)</b>	<b>Total Weight (g)</b>	<b>Total Weight (g)</b>	<b>Total Weight (g)</b>
Empty Container	_____	_____	_____	_____
Container and sample	_____	_____	_____	_____
Sample	_____	_____	_____	_____
Total Volume (units)	_____	_____	_____	_____
	<b>Field Dup Sample</b>		<b>Horizon Marker</b>	<b>Horiz. Marker Dup</b>
	<b>Total Weight (g)</b>		<b>Total Weight (g)</b>	<b>Total Weight (g)</b>
Empty Container	_____		_____	_____
Container and sample	_____		_____	_____
Sample	_____		_____	_____
Total Volume (units)	_____		_____	_____

\* Compositied sample from 10 locations: 3 locations from North zone, 4 locations from Center zone, 3 locations from South zone.

Comments: \_\_\_\_\_  
 Signature: \_\_\_\_\_

# **Destructive Sampling Field Sheet** **Porta-PSTA Cell Monitoring** **Periphyton-Based Stormwater Treatment Area (PSTA) Project**

148010.P2.06.CH

Porta-PSTA      3      5      10      12      14      17      19      20      21      (22)      Staff Gauge (in): \_\_\_\_\_

Field Team: \_\_\_\_\_  
 Date/Time: 2/12/01

<b>Periphyton:</b>	44.45 kg 46.02 L	<b>Floating/</b> <b>Metaphyton</b>	24.50 kg 26.50 L	<b>Wall</b>	53.98 kg 57.98 L	<b>Benthic</b>	EndWall <b>Periphyton</b>		
Total Volume (units):		12 gal + 600 ml		70 gal		15.5 ml + 1200 ml	① A		
<b>Vol. Subsample 1 (units):</b>		535 600 ml		575		100 ml 535	Inflow: 95	67	NO
Vol. DI added (mls):		425		1000		405	Outflow: 380	433	NO
Total Vol. Subsample 1:		1000		1575		1000		500	500
<b>Vol. Subsample 2 (units):</b>		585 1200 ml		630		600 ml 655			
Vol. DI added (mls):		415		370		345			
Total Vol. Subsample 2:		1000		1000		1000			
Field Duplicate:				FD2 (unit)					
	Can wt 6 lbs	Can + Sample 10.4 lbs		540 lbs		Can + Sample 12.5 lbs			

<b>Macrophytes:</b>	<b>Above Ground Portion (g)</b>			<b>Below Ground Portion (g)</b>		
	<b>Empty Container</b>	<b>Container and sample</b>	<b>Sample</b>	<b>Empty Container</b>	<b>Container and sample</b>	<b>Sample</b>
Total Weight (Wet)						
Wt. Subsample 1:						
Wt. Subsample 2:						
Field Duplicates:						

<b>Species Present</b>	<b>Percent</b>	<b>Species Present</b>	<b>Percent</b>	<b>Species Present</b>	<b>Percent</b>

<b>Animals:</b>	<b>Species</b>	<b>No. Individuals</b>	<b>Total Weight (g)</b>	
<b>Fish</b>				
			14 g	
			173 g	
<b>Snails</b>	<u>Helisoma</u>	93 43-2169	* 159 g	1st Sample + 250 ml H <sub>2</sub> O
<b>Others</b>	<u>water bug</u> <u>dragonfly nymph</u>			
			Total Volume (units)	375 ml mixed

<b>Sediment*:</b>	<b>0-10cm Sample 1</b>	<b>0-10cm Sample 2</b>	<b>10-20cm Sample 1</b>	<b>10-20cm Sample 2</b>
	<b>Total Weight (g)</b>	<b>Total Weight (g)</b>	<b>Total Weight (g)</b>	<b>Total Weight (g)</b>
Empty Container				
Container and sample				
Sample				
Total Volume (units)				
	<b>Field Dup Sample</b>		<b>Horizon Marker</b>	<b>Horiz. Marker Dup</b>
	<b>Total Weight (g)</b>		<b>Total Weight (g)</b>	<b>Total Weight (g)</b>
Empty Container				
Container and sample				
Sample				
Total Volume (units)				

\* Compositd sample from 10 locations: 3 locations from North zone, 4 locations from Center zone, 3 locations from South zone.

Comments: \_\_\_\_\_

Signature: \_\_\_\_\_

**Destructive Sampling Field Sheet**  
**Porta-PSTA Monitoring**  
**Periphyton-Based Stormwater Treatment Area (PSTA) Project**

148010.P2.06.CH

Field Team: \_\_\_\_\_ (See page 1 unless otherwise noted)  
 her Conditions: \_\_\_\_\_ (See page 1 unless otherwise noted)  
 Date: 2-12-01

Porta-PSTA Tank No.	Staff Gauge Reading	Water Depth Inflow	Water Depth Outflow	Accretion above Horizon Marker Upstream	Accretion above Horizon Marker Downstream
1					
2					
- 3	13 <sup>3</sup> / <sub>16</sub>	1.87	1.66		
4		2			
- 5	13	1.95	1.66		
6					
7					
8					
9					
- 10	12 <sup>5</sup> / <sub>8</sub>	1.65	1.69		
11					
- 12	11 <sup>3</sup> / <sub>4</sub>	1.58	1.65		
13					
- 14	13	1.75	1.68		
15					
16					
- 17	12 <sup>9</sup> / <sub>16</sub>	1.86	1.69		
18					
- 19	13 <sup>4</sup> / <sub>16</sub>	1.89	1.50		
20	10 <sup>1</sup> / <sub>4</sub>	1.62	1.41		
12/01 { 21	3 <sup>9</sup> / <sub>16</sub>	1.07	1.01		
22	5 <sup>1</sup> / <sub>16</sub>	1.10	1.02		
23		1.77	1.77		
24		1.76	1.76		

Comments: \_\_\_\_\_

Signature: \_\_\_\_\_

Chain of Custody Form  
PSTA

COC Number:	P256	Project:	HYTON-BASED STORMWATER TREATMENT AREA (PSTA) RESEARCH AND DEMONSTRATION PR	Kit Request ID:	
Project #:	148010.01.05.CH	Laboratory Coordinator:	Ellen Patterson / USA 954.426.6112 x233	Lab:	PPB

Sample ID	Station ID	Date & Time Collected	Matrix	Number of Containers	Analysis Requested	Comments
PP-3-MAC1	PP-3-MAC	02/14/01 1233	MC	1	AFDW, Ca++, DWght	
PP-3-MAC2	PP-3-MAC	02/14/01 1233	MC	1	AFDW, Ca++, DWght	
PP-5-MAC1	PP-5-MAC	02/14/01 1404	MC	1	AFDW, Ca++, DWght	
PP-5-MAC2	PP-5-MAC	02/14/01 1405	MC	1	AFDW, Ca++, DWght	
PP-10-MAC1	PP-10-MAC	02/14/01 1651	MC	1	AFDW, Ca++, DWght	
PP-10-MAC2	PP-10-MAC	02/14/01 1651	MC	1	AFDW, Ca++, DWght	
PP-12-MAC1	PP-12-MAC	02/15/01 0855	MC	1	AFDW, Ca++, DWght	
PP-12-MAC2	PP-12-MAC	02/15/01 0855	MC	1	AFDW, Ca++, DWght	
PP-14-MAC1	PP-14-MAC	02/15/01 1020	MC	1	AFDW, Ca++, DWght	
PP-14-MAC2	PP-14-MAC	02/15/01 1020	MC	1	AFDW, Ca++, DWght	
PP-17-MAC1	PP-17-MAC	02/15/01 1450	MC	1	AFDW, Ca++, DWght	
PP-17-MAC2	PP-17-MAC	02/15/01 1651	MC	1	AFDW, Ca++, DWght	
PP-19-MAC1	PP-19-MAC	02/14/01 0850	MC	1	AFDW, Ca++, DWght	
PP-19-MAC2	PP-19-MAC	02/14/01 0855	MC	1	AFDW, Ca++, DWght	
PP-20-MAC1	PP-20-MAC	02/13/01 1150	MC	1	AFDW, Ca++, DWght	
PP-20-MAC2	PP-20-MAC	02/13/01 1150	MC	1	AFDW, Ca++, DWght	
PP-FD1-MAC	PP-FD1-MAC	02/14/01 0900	MC	1	AFDW, Ca++, DWght	
PP-FD2-MAC	PP-FD2-MAC	02/14/01 1233	MC	1	AFDW, Ca++, DWght	

Sampled By:	UPS	FedEx	Hand	Other (please specify):	Date / Time:	Relinquished By:	Date / Time:
Shipped Via:	UPS	FedEx	Hand	Other (please specify):	Date / Time:	Relinquished By:	Date / Time:
Received By:					Date / Time:	Relinquished By:	Date / Time:
Received By:					Date / Time:	Relinquished By:	Date / Time:
Remarks:							

## Chain of Custody Form

PSTA

COC Number:	P258	Project:	HYTON-BASED STORMWATER TREATMENT AREA (PSTA) RESEARCH AND DEMONSTRATION PR	Kit Request ID:	
Project #:	148010.01.05.CH	Laboratory Coordinator:	Ellen Patterson / USA 954.426.6112 x233	Lab:	PPB

Sample ID	Station ID	Date & Time Collected	Matrix	Number of Containers	Analysis Requested	Comments
PP-3-RTS1	PP-3-RTS	02/14/01 12:33	MC	1	AFDW, Ca++, DWght	
PP-3-RTS2	PP-3-RTS	12:33	MC	1	AFDW, Ca++, DWght	
PP-5-RTS1	PP-5-RTS	14:15	MC	1	AFDW, Ca++, DWght	
PP-5-RTS2	PP-5-RTS	14:15	MC	1	AFDW, Ca++, DWght	
PP-10-RTS1	PP-10-RTS	17:00	MC	1	AFDW, Ca++, DWght	
PP-10-RTS2	PP-10-RTS	17:00	MC	1	AFDW, Ca++, DWght	
PP-12-RTS1	PP-12-RTS	02/15/01 09:00	MC	1	AFDW, Ca++, DWght	
PP-12-RTS2	PP-12-RTS	09:00	MC	1	AFDW, Ca++, DWght	
PP-14-RTS1	PP-14-RTS	16:30	MC	1	AFDW, Ca++, DWght	
PP-14-RTS2	PP-14-RTS	16:30	MC	1	AFDW, Ca++, DWght	
PP-17-RTS1	PP-17-RTS	17:00	MC	1	AFDW, Ca++, DWght	
PP-17-RTS2	PP-17-RTS	17:00	MC	1	AFDW, Ca++, DWght	
PP-19-RTS1	PP-19-RTS	02/14/01 09:05	MC	1	AFDW, Ca++, DWght	
PP-19-RTS2	PP-19-RTS	02/14/01 09:10	MC	1	AFDW, Ca++, DWght	
PP-20-RTS1	PP-20-RTS	02/13/01 11:55	MC	1	AFDW, Ca++, DWght	
PP-20-RTS2	PP-20-RTS	02/13/01 11:55	MC	1	AFDW, Ca++, DWght	
PP-FD1-RTS	PP-FD1-RTS	02/14/01 09:15	MC	1	AFDW, Ca++, DWght	
PP-FD2-RTS	PP-FD2-RTS	02/14/01 12:33	MC	1	AFDW, Ca++, DWght	

Sampled By:	Date / Time:	Custody Seal: Y / N	Relinquished By:	Date / Time:
Shipped Via: UPS FedEx Hand Other (please specify):				
Received By:	Date / Time:	Cooler Temp:	Relinquished By:	Date / Time:
Received By:	Date / Time:	Cooler Temp:	Relinquished By:	Date / Time:
Remarks:				

<b>COC Number:</b>	P247	<b>Project:</b>	HYTON-BASED STORMWATER TREATMENT AREA (PSTA) RESEARCH AND DEMONSTRATION PROJECT		<b>Kit Request ID:</b>	
<b>Project #:</b>	148010.01.05.CH	<b>Laboratory Coordinator:</b>	Ellen Patterson / USA 954.426.6112 x233		<b>Lab:</b>	PPB

Sample ID	Station ID	Date & Time Collected	Matrix	Number of Containers	Analysis Requested	Comments
PP-3-UPR1	PP-3-UPR	02/401	PP	2	PSOLIDS, BD, Ca++	
PP-3-UPR2	PP-3-UPR	08/13	PP	2	PSOLIDS, BD, Ca++	
PP-5-UPR1	PP-5-UPR	1040	PP	2	PSOLIDS, BD, Ca++	
PP-5-UPR2	PP-5-UPR	1042	PP	2	PSOLIDS, BD, Ca++	
PP-10-UPR1	PP-10-UPR	1530	PP	2	PSOLIDS, BD, Ca++	
PP-10-UPR2	PP-10-UPR	1535	PP	2	PSOLIDS, BD, Ca++	
PP-12-UPR1	PP-12-UPR	1740	PP	2	PSOLIDS, BD, Ca++	
PP-12-UPR2	PP-12-UPR	1745	PP	2	PSOLIDS, BD, Ca++	
PP-14-UPR1	PP-14-UPR	1515	PP	2	PSOLIDS, BD, Ca++	
PP-14-UPR2	PP-14-UPR	1517	PP	2	PSOLIDS, BD, Ca++	
PP-17-UPR1	PP-17-UPR	1435	PP	2	PSOLIDS, BD, Ca++	
PP-17-UPR2	PP-17-UPR	1437	PP	2	PSOLIDS, BD, Ca++	
PP-19-UPR1	PP-19-UPR	1355	PP	2	PSOLIDS, BD, Ca++	
PP-19-UPR2	PP-19-UPR	1400	PP	2	PSOLIDS, BD, Ca++	
PP-20-UPR1	PP-20-UPR	1030	PP	2	PSOLIDS, BD, Ca++	
PP-20-UPR2	PP-20-UPR	1035	PP	2	PSOLIDS, BD, Ca++	
PP-FD1-UPR	PP-FD1-UPR	1407	PP	2	PSOLIDS, BD, Ca++	
PP-FD2-UPR	PP-FD2-UPR	02/401	PP	2	PSOLIDS, BD, Ca++	
PP-EB1-UPR	PP-EB1-UPR	1155	WQ	1	Ca++	
PP-EB2-UPR	PP-EB2-UPR	1156	WQ	1	Ca++	
PP-EB3-UPR	PP-EB3-UPR	1156	WQ	1	Ca++	

Sampled By:	Date / Time:		Custody Seal: Y / N	Relinquished By:	Date / Time:	
Shipped Via:	UPS	FedEx	Hand	Other (please specify):		
Received By:	Date / Time:		Cooler Temp:	Custody Seal: Y / N	Relinquished By:	Date / Time:
Received By:	Date / Time:		Cooler Temp:	Custody Seal: Y / N	Relinquished By:	Date / Time:
Remarks:						



# CH2M HILL

## Chain of Custody Form

### PSTA

COC Number:

P247

Project:

HYTON-BASED STORMWATER TREATMENT AREA (PSTA) RESEARCH AND DEMONSTRATION PR

Project #:

148010.01.05.CH

Laboratory Coordinator:

Ellen Patterson / USA 954.426.6112 x233

Kit Request ID:

Lab:

PPB

Sample ID	Station ID	Date & Time Collected	Matrix	Number of Containers	Analysis Requested	Comments
PP-3-WP1	PP-3-WP	02/13/01 1325	PP	1	AFDW, Ca++, DWght	
PP-3-WP2	PP-3-WP	1330	PP	1	AFDW, Ca++, DWght	
PP-5-WP1	PP-5-WP	1530	PP	1	AFDW, Ca++, DWght	
PP-5-WP2	PP-5-WP	1538	PP	1	AFDW, Ca++, DWght	
PP-10-WP1	PP-10-WP	02/14/01 1100	PP	1	AFDW, Ca++, DWght	
PP-10-WP2	PP-10-WP	1105	PP	1	AFDW, Ca++, DWght	
PP-12-WP1	PP-12-WP	1330	PP	1	AFDW, Ca++, DWght	
PP-12-WP2	PP-12-WP	1338	PP	1	AFDW, Ca++, DWght	
PP-14-WP1	PP-14-WP	02/15/01 0945	PP	1	AFDW, Ca++, DWght	
PP-14-WP2	PP-14-WP	0950	PP	1	AFDW, Ca++, DWght	
PP-17-WP1	PP-17-WP	1203	PP	1	AFDW, Ca++, DWght	
PP-17-WP2	PP-17-WP	1205	PP	1	AFDW, Ca++, DWght	
PP-19-WP1	PP-19-WP	02/13/01 1055	PP	1	AFDW, Ca++, DWght	
PP-19-WP2	PP-19-WP	1100	PP	1	AFDW, Ca++, DWght	
PP-20-WP1	PP-20-WP	1300	PP	1	AFDW, Ca++, DWght	
PP-20-WP2	PP-20-WP	1305	PP	1	AFDW, Ca++, DWght	
PP-21-WP1	PP-21-WP	02/12/01 1545	PP	1	AFDW, Ca++, DWght	
PP-21-WP2	PP-21-WP	1550	PP	1	AFDW, Ca++, DWght	
PP-22-WP1	PP-22-WP	1600	PP	1	AFDW, Ca++, DWght	
PP-22-WP2	PP-22-WP	1605	PP	1	AFDW, Ca++, DWght	
PP-FD1-WP	PP-FD1-WP	02/13/01 1607	PP	1	AFDW, Ca++, DWght	
PP-FD2-WP	PP-FD2-WP	02/13/01 1555	PP	1	AFDW, Ca++, DWght	
PP-EB1-WP	PP-EB1-WP	02/14/01 1023	WQ	1	AFDW, Ca++, DWght	
PP-EB2-WP	PP-EB2-WP	02/14/01 1024	WQ	1	AFDW, Ca++, DWght	

Sampled By:

Date / Time:

Custody Seal: Y / N

Relinquished By:

Date / Time:

Shipped Via: UPS FedEx Hand Other (please specify):

Received By:

Date / Time:

Cooler Temp:

Relinquished By:

Date / Time:

Received By:

Date / Time:

Cooler Temp:

Relinquished By:

Date / Time:

Remarks:

CH2M HILL  
Chain of Custody Form  
PSTA

COC Number:	P247	Project:	HYTON-BASED STORMWATER TREATMENT AREA (PSTA) RESEARCH AND DEMONSTRATION PR	Kit Request ID:	
Project #:	148010.01.05.CH	Laboratory Coordinator:	Ellen Patterson / USA 954.426.6112 x233	Lab:	PPB

Sample ID	Station ID	Date & Time Collected	Matrix	Number of Containers	Analysis Requested	Comments
PP-3-BP1	PP-3-BP	02/30/01 1547	PP	1	AFDW, Ca++, DWght	
PP-3-BP2	PP-3-BP	02/30/01 1550	PP	1	AFDW, Ca++, DWght	
PP-5-BP1	PP-5-BP	02/14/01 0800	PP	1	AFDW, Ca++, DWght	
PP-5-BP2	PP-5-BP	02/14/01 0803	PP	1	AFDW, Ca++, DWght	
PP-10-BP1	PP-10-BP	02/14/01 1330	PP	1	AFDW, Ca++, DWght	
PP-10-BP2	PP-10-BP	02/14/01 1335	PP	1	AFDW, Ca++, DWght	
PP-14-BP1	PP-14-BP	02/15/01 1107	PP	1	AFDW, Ca++, DWght	
PP-14-BP2	PP-14-BP	02/15/01 1109	PP	1	AFDW, Ca++, DWght	
PP-17-BP1	PP-17-BP	02/15/01 1210	PP	1	AFDW, Ca++, DWght	
PP-17-BP2	PP-17-BP	02/15/01 1215	PP	1	AFDW, Ca++, DWght	
PP-19-BP1	PP-19-BP	02/13/01 1125	PP	1	AFDW, Ca++, DWght	
PP-19-BP2	PP-19-BP	02/13/01 1130	PP	1	AFDW, Ca++, DWght	
PP-20-BP1	PP-20-BP	02/13/01 0943	PP	1	AFDW, Ca++, DWght	
PP-20-BP2	PP-20-BP	02/13/01 0950	PP	1	AFDW, Ca++, DWght	
PP-21-BP1	PP-21-BP	02/12/01 1635	PP	1	AFDW, Ca++, DWght	
PP-21-BP2	PP-21-BP	02/12/01 1640	PP	1	AFDW, Ca++, DWght	
PP-22-BP1	PP-22-BP	02/12/01 1525	PP	1	AFDW, Ca++, DWght	
PP-22-BP2	PP-22-BP	02/12/01 1530	PP	1	AFDW, Ca++, DWght	
PP-FD1-BP	PP-FD1-BP	02/13/01 0953	PP	1	AFDW, Ca++, DWght	
PP-FD2-BP	PP-FD2-BP	02/13/01 0945	PP	1	AFDW, Ca++, DWght	
PP-EB1-BP	PP-EB1-BP	02/14/01 1025	WQ	1	AFDW, Ca++, DWght	
PP-EB2-BP	PP-EB2-BP	02/14/01 1026	WQ	1	AFDW, Ca++, DWght	

Sampled By:	Date / Time:	Custody Seal: Y / N	Relinquished By:	Date / Time:
Shipped Via:	UPS FedEx Hand Other (please specify):			
Received By:	Date / Time:	Cooler Temp:	Relinquished By:	Date / Time:
Received By:	Date / Time:	Cooler Temp:	Relinquished By:	Date / Time:
Remarks:				

# Chain of Custody Form

**PSTA**

<b>COC Number:</b>	P260	<b>Project:</b>	HYTON-BASED STORMWATER TREATMENT AREA (PSTA) RESEARCH AND DEMONSTRATION PR		<b>Kit Request ID:</b>	
<b>Project #:</b>	148010.01.05.CH	<b>Laboratory Coordinator:</b>	Ellen Patterson / USA 954.426.6112 x233		<b>Lab:</b>	PPB

Sample ID	Station ID	Date & Time Collected	Matrix	Number of Containers	Analysis Requested	Comments
PP-3-CON	PP-3-CON	02/20/1	FT	1	AFDW, Ca++, DWght	
PP-6-CON	PP-6-CON	1320	FT	1	AFDW, Ca++, DWght	
PP-10-CON	PP-10-CON	1445	FT	1	AFDW, Ca++, DWght	
PP-12-CON	PP-12-CON	1510	FT	1	AFDW, Ca++, DWght	
PP-14-CON	PP-14-CON	1525	FT	1	AFDW, Ca++, DWght	
PP-17-CON	PP-17-CON	1420	FT	1	AFDW, Ca++, DWght	
PP-19-CON	PP-19-CON	1300	FT	1	AFDW, Ca++, DWght	
PP-20-CON	PP-20-CON	1310	FT	1	AFDW, Ca++, DWght	
PP-21-CON	PP-21-CON	02/20/1	FT	1	AFDW, Ca++, DWght	
PP-22-CON	PP-22-CON	1635	FT	1	AFDW, Ca++, DWght	
PP-FD1-CON	PP-FD1-CON	1512	FT	1	AFDW, Ca++, DWght	

Sampled By:	Date / Time:		Custody Seal: Y / N	Relinquished By:	Date / Time:	
Shipped Via:	UPS	FedEx	Hand	Other (please specify):		
Received By:	Date / Time:		Cooler Temp:	Custody Seal: Y / N	Relinquished By:	Date / Time:
Received By:	Date / Time:		Cooler Temp:	Custody Seal: Y / N	Relinquished By:	Date / Time:
Remarks:						

CH2M HILL  
Chain of Custody Form  
PSTA

Generated on: 02/02/2001 1:31:09 PM

COC Number:	P247	Project:	HYTON-BASED STORMWATER TREATMENT AREA (PSTA) RESEARCH AND DEMONSTRATION PR	Kit Request ID:	
Project #:	148010.01.05.CH	Laboratory Coordinator:	Ellen Patterson / USA 954.426.6112 x233	Lab:	PPB

Sample ID	Station ID	Date & Time Collected	Matrix	Number of Containers	Analysis Requested	Comments
PP-3-FP1	PP-3-FP	02/30/01 13:56	PP	1	AFDW, Cat+, DWght	
PP-3-FP2	PP-3-FP	13:50	PP	1	AFDW, Cat+, DWght	
PP-5-FP1	PP-5-FP	1540	PP	1	AFDW, Cat+, DWght	
PP-5-FP2	PP-5-FP	1545	PP	1	AFDW, Cat+, DWght	
PP-10-FP1	PP-10-FP	02/14/01 1010	PP	1	AFDW, Cat+, DWght	
PP-10-FP2	PP-10-FP	02/14/01 1012	PP	1	AFDW, Cat+, DWght	
PP-14-FP1	PP-14-FP	02/15/01 0925	PP	1	AFDW, Cat+, DWght	
PP-14-FP2	PP-14-FP	0930	PP	1	AFDW, Cat+, DWght	
PP-17-FP1	PP-17-FP	1100	PP	1	AFDW, Cat+, DWght	
PP-17-FP2	PP-17-FP	1105	PP	1	AFDW, Cat+, DWght	
PP-19-FP1	PP-19-FP	02/13/01 0930	PP	1	AFDW, Cat+, DWght	
PP-19-FP2	PP-19-FP	02/13/01 0937	PP	1	AFDW, Cat+, DWght	
PP-20-FP1	PP-20-FP	02/12/01 1650	PP	1	AFDW, Cat+, DWght	
PP-20-FP2	PP-20-FP	1655	PP	1	AFDW, Cat+, DWght	
PP-21-FP1	PP-21-FP	1510	PP	1	AFDW, Cat+, DWght	
PP-21-FP2	PP-21-FP	1515	PP	1	AFDW, Cat+, DWght	
PP-22-FP1	PP-22-FP	1455	PP	1	AFDW, Cat+, DWght	
PP-22-FP2	PP-22-FP	1500	PP	1	AFDW, Cat+, DWght	
PP-FD1-FP	PP-FD1-FP	02/13/01 0939	PP	1	AFDW, Cat+, DWght	
PP-FD2-FP	PP-FD2-FP	02/13/01 0935	PP	1	AFDW, Cat+, DWght	
PP-EB1-FP	PP-EB1-FP	02/14/01 1021	WQ	1	AFDW, Cat+, DWght	
PP-EB2-FP	PP-EB2-FP	02/14/01 1022	WQ	1	AFDW, Cat+, DWght	

Sampled By:	Date / Time:	Custody Seal: Y / N	Relinquished By:	Date / Time:
Shipped Via: UPS FedEx Hand Other (please specify):				
Received By:	Date / Time:	Cooler Temp:	Relinquished By:	Date / Time:
Received By:	Date / Time:	Cooler Temp:	Relinquished By:	Date / Time:
Remarks:				

## Chain of Custody Form

PSTA

COC Number:	P250	Project:	HYTON-BASED STORMWATER TREATMENT AREA (PSTA) RESEARCH AND DEMONSTRATION PR	Kit Request ID:	WAR
Project #:	148010.01.05.CH	Laboratory Coordinator:	Ellen Patterson / USA 954.426.6112 x233	Lab:	

Sample ID	Station ID	Date & Time Collected	Matrix	Number of Containers	Analysis Requested	Comments
PP-3-IP	PP-3-IP A	02/12/01 1220	PP	1	TAX 2	
PP-5-IP	PP-5-IP A	02/12/01 1530	PP	1	TAX 2	
PP-10-IP	PP-10-IP A	02/14/01 0930	PP	1	TAX 2	
PP-12-IP	PP-12-IP A	02/14/01 1150	PP	1	TAX 2	
PP-14-IP	PP-14-IP A	02/14/01 1205	PP	1	TAX 2	
PP-17-IP	PP-17-IP A	02/15/01 0930	PP	1	TAX 2	
PP-19-IP	PP-19-IP A	02/15/01 0845	PP	1	TAX 2	
PP-20-IP	PP-20-IP A	02/15/01 1625	PP	1	TAX 2	
PP-21-IP	PP-21-IP A	02/15/01 1445	PP	1	TAX 2	
PP-22-IP	PP-22-IP A	02/15/01 1415	PP	1	TAX 2	
PP-3-OP	PP-3-OP A	02/13/01 1225	PP	1	TAX 2	
PP-5-OP	PP-5-OP A	02/13/01 1520	PP	1	TAX 2	
PP-10-OP	PP-10-OP A	02/14/01 0935	PP	1	TAX 2	
PP-12-OP	PP-12-OP A	02/14/01 1130	PP	1	TAX 2	
PP-14-OP	PP-14-OP A	02/15/01 1155	PP	1	TAX 2	
PP-17-OP	PP-17-OP A	02/15/01 0910	PP	1	TAX 2	
PP-19-OP	PP-19-OP A	02/15/01 0850	PP	1	TAX 2	
PP-20-OP	PP-20-OP A	02/15/01 1630	PP	1	TAX 2	
PP-21-OP	PP-21-OP A	02/15/01 1430	PP	1	TAX 2	
PP-22-OP	PP-22-OP A	02/15/01 1400	PP	1	TAX 2	
	PP-3-IPB	02/13/01 1220				
	3-IP-C	02/13/01 1220				
	5-IP-B	02/13/01 1530				

Sampled By:	Date / Time:	Custody Seal: Y / N	Relinquished By:	Date / Time:
Shipped Via: UPS FedEx Hand Other (please specify):				
Received By:	Date / Time:	Cooler Temp:	Relinquished By:	Date / Time:
Received By:	Date / Time:	Cooler Temp:	Relinquished By:	Date / Time:
Remarks:				

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Chain of Custody Form  
PSTA

COC Number: P247 Project: HYTON-BASED STORMWATER TREATMENT AREA (PSTA) RESEARCH AND DEMONSTRATION PR Kit Request ID: PPB  
Project #: 148010.01.05.CH Laboratory Coordinator: Ellen Patterson / USA 954.426.6112 x233 Lab: PPB

Sample ID	Station ID	Date & Time Collected	Matrix	Number of Containers	Analysis Requested	Comments
	5.18C	02/23/01 1520				
	10.18B	02/14/01 0930				
	10.18C	0930				
	12.18B	1140				
	12.18C	1150				
	14.18B	1205				
	14.18C	1205				
	17.18B	02/15/01 0920				
	17.18C	02/15/01 0920				
	18.18B	02/13/01 0845				
	19.18C	02/13/01 0845				
	20.18B	02/12/01 1625				
	20.18C	1625				
	21.18B	1445				
	* 21.18C	1445				
	2.08B	02/13/01 1225				
	3.08C	1225				
	5.08B	1520				
	5.08C	1520				
	10.08B	02/14/01 0935				
	10.08C	0935				
	12.08B	1130				
	12.08C	1130				
	14.08B	1155				
	14.08C	1155				

Sampled By:	Date / Time:	Custody Seal: Y / N	Relinquished By:	Date / Time:
Shipped Via: UPS FedEx Hand Other (please specify):				
Received By:	Date / Time:	Cooler Temp:	Relinquished By:	Date / Time:
Received By:	Date / Time:	Cooler Temp:	Relinquished By:	Date / Time:
Remarks:				

## Chain of Custody Form

PSTA

COC Number:	P249	Project:	HYTON-BASED STORMWATER TREATMENT AREA (PSTA) RESEARCH AND DEMONSTRATION PR	Kit Request ID:	
Project #:	148010.01.05.CH	Laboratory Coordinator:	Ellen Patterson / USA 954.426.6112 x233	Lab:	IFAS

Sample ID	Station ID	Date & Time Collected	Matrix	Number of Containers	Analysis Requested	Comments
	17-08-B	0910	0910			
	17-08-C	0910	0910			
	19-09-B	0830	0830			
	19-09-C	0830	0830			
	20-08-B	0210	1630			
	20-08-C	1630	1630			
	21-08-B	1430	1430			
	21-08-C	1430	1430			
	22-08-B	1430	1430			
	22-08-C	1430	1430			
	22-12-B	0210	1415			
	22-12-C	1415	1415			

Sampled By:	Date / Time:	Custody Seal: Y / N	Relinquished By:	Date / Time:
Shipped Via: UPS FedEx Hand Other (please specify):				
Received By:	Date / Time:	Cooler Temp:	Relinquished By:	Date / Time:
Received By:	Date / Time:	Cooler Temp:	Relinquished By:	Date / Time:
Remarks:				

## Chain of Custody Form

PSTA

COC Number:	P247	Project:	HYTON-BASED STORMWATER TREATMENT AREA (PSTA) RESEARCH AND DEMONSTRATION PR	Kit Request ID:	
Project #:	148010.01.05.CH	Laboratory Coordinator:	Ellen Patterson / USA 954.426.6112 x233	Lab:	PPB

Sample ID	Station ID	Date & Time Collected	Matrix	Number of Containers	Analysis Requested	Comments
PP-3-LWR1	PP-3-LWR	02/14/01 0820	PP	2	CA_S, PSOLIDS, BD	
PP-3-LWR2	PP-3-LWR	0823	PP	2	CA_S, PSOLIDS, BD	
PP-6-LWR1	PP-6-LWR	1045	PP	2	CA_S, PSOLIDS, BD	
PP-6-LWR2	PP-6-LWR	1047	PP	2	CA_S, PSOLIDS, BD	
PP-10-LWR1	PP-10-LWR	1540	PP	2	CA_S, PSOLIDS, BD	
PP-10-LWR2	PP-10-LWR	1545	PP	2	CA_S, PSOLIDS, BD	
PP-12-LWR1	PP-12-LWR	1730	PP	2	CA_S, PSOLIDS, BD	
PP-12-LWR2	PP-12-LWR	1735	PP	2	CA_S, PSOLIDS, BD	
PP-14-LWR1	PP-14-LWR	02/15/01 1520	PP	2	CA_S, PSOLIDS, BD	
PP-14-LWR2	PP-14-LWR	1525	PP	2	CA_S, PSOLIDS, BD	
PP-17-LWR1	PP-17-LWR	1440	PP	2	CA_S, PSOLIDS, BD	
PP-17-LWR2	PP-17-LWR	1445	PP	2	CA_S, PSOLIDS, BD	
PP-19-LWR1	PP-19-LWR	02/13/01 1405	PP	2	CA_S, PSOLIDS, BD	
PP-19-LWR2	PP-19-LWR	1410	PP	2	CA_S, PSOLIDS, BD	
PP-20-LWR1	PP-20-LWR	1540	PP	2	CA_S, PSOLIDS, BD	
PP-20-LWR2	PP-20-LWR	1546	PP	2	CA_S, PSOLIDS, BD	
PP-FD1-LWR	PP-FD1-LWR	1047	PP	2	CA_S, PSOLIDS, BD	
PP-FD2-LWR	PP-FD2-LWR	0828	PP	2	CA_S, PSOLIDS, BD	
PP-EB1-LWR	PP-EB1-LWR	1157	WQ	1	Ca++	
PP-EB2-LWR	PP-EB2-LWR	1157	WQ	1	Ca++	
PP-FD3-LWR	PP-FD3-LWR	1547	PP	2	CA_S, PSOLIDS, BD	

Sampled By:	Date / Time:	Custody Seal: Y / N	Relinquished By:	Date / Time:
Shipped Via: UPS FedEx Hand Other (please specify):				
Received By:	Date / Time:	Cooler Temp:	Relinquished By:	Date / Time:
Received By:	Date / Time:	Cooler Temp:	Relinquished By:	Date / Time:
Remarks:				



# Chain of Custody Form

**PSTA**

COC Number:	P252	Project:	HYTON-BASED STORMWATER TREATMENT AREA (PSTA) RESEARCH AND DEMONSTRATION PROJECT	Kit Request ID:	
Project #:	148010.01.05.CH	Laboratory Coordinator:	Ellen Patterson / USA 954.426.6112 x233	Lab:	IFAS

Sample ID	Station ID	Date & Time Collected		Matrix	Number of Containers	Analysis Requested	Comments
P2-0693	PP-3-LWR	02/14/01	0823	SD	1	TIP_SE, TP	
P2-0694	PP-3-LWR		0829	SD	1	TP_S	
P2-0695	PP-5-LWR		1047	SD	1	TIP_SE, TP	
P2-0696	PP-5-LWR		1045	SD	1	TP_S	
P2-0697	PP-10-LWR		1545	SD	1	TIP_SE, TP	
P2-0698	PP-10-LWR		1540	SD	1	TP_S	
P2-0699	PP-12-LWR		1735	SD	1	TIP_SE, TP	
P2-0700	PP-12-LWR		1730	SD	1	TP_S	
P2-0701	PP-14-LWR	02/15/01	1525	SD	1	TIP_SE, TP	
P2-0702	PP-14-LWR		1520	SD	1	TP_S	
P2-0703	PP-17-LWR		1445	SD	1	TIP_SE, TP	
P2-0704	PP-17-LWR		1440	SD	1	TP_S	
P2-0705	PP-19-LWR	02/15/01	1410	SD	1	TIP_SE, TP	
P2-0706	PP-19-LWR		1405	SD	1	TP_S	
P2-0707	PP-20-LWR		1045	SD	1	TIP_SE, TP	
P2-0708	PP-20-LWR		1040	SD	1	TP_S	
P2-0709	PP-FD1-LWR		1047	SD	1	TIP_SE, TP	
P2-0710	PP-FD2-LWR	02/14/01	0908	SD	1	TP_S	
P2-0711	PP-FD3-LWR		1547	SD	1	TP_S	
P2-0712	PP-EB1-LWR		1157	WQ	1	TIP_SE, TP	
P2-0713	PP-EB2-LWR		1158	WQ	1	TP_S	

Sampled By:	Date / Time:		Custody Seal: Y / N	Relinquished By:	Date / Time:
Shipped Via:	UPS	FedEx	Hand	Other (please specify):	
Received By:	Date / Time:		Cooler Temp:	Relinquished By:	Date / Time:
Received By:	Date / Time:		Cooler Temp:	Relinquished By:	Date / Time:
Remarks:					

CH2M HILL  
Chain of Custody Form  
PSTA

FEBRUARY 12, 2001 PSTA DESTRUCTIVE SAMPLING EVENT - FP

COC Number: P241 Project: HYTON-BASED STORMWATER TREATMENT AREA (PSTA) RESEARCH AND DEMONSTRATION PR Kit Request ID: IFAS

Project #: 148010.01.05.CH Laboratory Coordinator: Ellen Patterson / USA 954.426.6112 x233 Lab:

Sample ID	Station ID	Date & Time Collected	Matrix	Number of Containers	Analysis Requested	Comments
P2-0600	PP-3-FP	02/13/01 1350	PP	1	TIP P, TP P	
P2-0601	PP-3-FP	1356	PP	1	TP P	
P2-0602	PP-5-FP	1543	PP	1	TIP P, TP P	
P2-0603	PP-5-FP	1540	PP	1	TP P	
P2-0604	PP-10-FP	02/14/01 1012	PP	1	TIP P, TP P	
P2-0605	PP-10-FP	02/14/01 1010	PP	1	TP P	
P2-0606	PP-12-FP		PP	1	TIP P, TP P	
P2-0607	PP-12-FP		PP	1	TP P	
P2-0608	PP-14-FP	02/15/01 0930	PP	1	TIP P, TP P	
P2-0609	PP-14-FP	0935	PP	1	TP P	
P2-0610	PP-17-FP	09105	PP	1	TIP P, TP P	
P2-0611	PP-17-FP	1100	PP	1	TP P	
P2-0612	PP-19-FP	02/13/01 0937	PP	1	TIP P, TP P	
P2-0613	PP-19-FP	02/13/01 0930	PP	1	TP P	
P2-0614	PP-20-FP	02/12/01 1655	PP	1	TIP P, TP P	
P2-0615	PP-20-FP	1650	PP	1	TP P	
P2-0616	PP-21-FP	1515	PP	1	TIP P, TP P	
P2-0617	PP-21-FP	1510	PP	1	TP P	
P2-0618	PP-22-FP	1500	PP	1	TIP P, TP P	
P2-0619	PP-22-FP	1455	PP	1	TP P	
P2-0620	PP-FD1-FP	02/13/01 0939	PP	1	TIP P, TP P	
P2-0621	PP-FD2-FP	02/13/01 0935	PP	1	TP P	
P2-0622	PP-EB1-FP	02/14/01 1021	WQ	1	TIP P, TP P	
P2-0623	PP-EB2-FP	02/14/01 1022	WQ	1	TP P	

Sampled By:	Date / Time:	Custody Seal: Y / N	Relinquished By:	Date / Time:
Shipped Via: UPS FedEx Hand Other (please specify):				
Received By:	Date / Time:	Cooler Temp:	Relinquished By:	Date / Time:
Received By:	Date / Time:	Cooler Temp:	Relinquished By:	Date / Time:
Remarks:				

## Chain of Custody Form

PSTA

Generated on: 02/02/2001 4:43:04 PM

COC Number:	P259	Project:	HYTON-BASED STORMWATER TREATMENT AREA (PSTA) RESEARCH AND DEMONSTRATION PR	Kit Request ID:	
Project #:	148010.01.05.CH	Laboratory Coordinator:	Ellen Patterson / USA 954.426.6112 x233	Lab:	IFAS

Sample ID	Station ID	Date & Time Collected	Matrix	Number of Containers	Analysis Requested	Comments
P2-0769	PP-3-CON	02/15/01 1430	FT	1	TP_S T.R	
P2-0760	PP-5-CON	1320	FT	1	TP_S T.R	
P2-0761	PP-10-CON	1445	FT	1	TP_S T.R	
P2-0762	PP-12-CON	1510	FT	1	TP_S T.R	
P2-0763	PP-14-CON	1525	FT	1	TP_S T.R	
P2-0764	PP-17-CON	1420	FT	1	TP_S T.R	
P2-0765	PP-19-CON	1300	FT	1	TP_S T.R	
P2-0766	PP-20-CON	1310	FT	1	TP_S T.R	
P2-0767	PP-21-CON	02/12/01 1635	FT	1	TP_S T.R	
P2-0768	PP-22-CON	1635	FT	1	TP_S T.R	
P2-0769	PP-FD1-CON	1512	FT	1	TP_S T.R	

Sampled By:	Date / Time:	Custody Seal: Y / N	Relinquished By:	Date / Time:
Shipped Via: UPS FedEx Hand Other (please specify):				
Received By:	Date / Time:	Cooler Temp:	Relinquished By:	Date / Time:
Received By:	Date / Time:	Cooler Temp:	Relinquished By:	Date / Time:
Remarks:				

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Chain of Custody Form  
PSTA

COC Number:	P249	Project:	HYTON-BASED STORMWATER TREATMENT AREA (PSTA) RESEARCH AND DEMONSTRATION PR	Kit Request ID:	
Project #:	148010.01.05.CH	Laboratory Coordinator:	Ellen Patterson / USA 954.426.6112 x233	Lab:	IFAS

Sample ID	Station ID	Date & Time Collected	Matrix	Number of Containers	Analysis Requested	Comments
P2-0648	PP-3-BP	02/13/01 1550	PP	1	TIP_P, TP_P	
P2-0649	PP-3-BP	02/13/01 1547	PP	1	TP_P	
P2-0650	PP-5-BP	02/14/01 0803	PP	1	TIP_P, TP_P	
P2-0651	PP-5-BP	02/14/01 0800	PP	1	TP_P	
P2-0652	PP-10-BP	02/14/01 1335	PP	1	TIP_P, TP_P	
P2-0653	PP-10-BP	02/14/01 1350	PP	1	TP_P	
P2-0654	PP-14-BP	02/15/01 1109	PP	1	TIP_P, TP_P	
P2-0655	PP-14-BP	02/15/01 1107	PP	1	TP_P	
P2-0656	PP-17-BP	02/15/01 1215	PP	1	TIP_P, TP_P	
P2-0657	PP-17-BP	02/15/01 1210	PP	1	TP_P	
P2-0658	PP-19-BP	02/13/01 1130	PP	1	TIP_P, TP_P	
P2-0659	PP-19-BP	02/13/01 1125	PP	1	TP_P	
P2-0660	PP-20-BP	02/13/01 0950	PP	1	TIP_P, TP_P	
P2-0661	PP-20-BP	02/13/01 0943	PP	1	TP_P	
P2-0662	PP-21-BP	02/13/01 1640	PP	1	TIP_P, TP_P	
P2-0663	PP-21-BP	02/13/01 1635	PP	1	TP_P	
P2-0664	PP-22-BP	02/13/01 1530	PP	1	TIP_P, TP_P	
P2-0665	PP-22-BP	02/13/01 1525	PP	1	TP_P	
P2-0666	PP-FD1-BP	02/13/01 0953	PP	1	TIP_P, TP_P	
P2-0667	PP-FD1-BP	02/13/01 0943	PP	1	TP_P	
P2-0668	PP-EB1-BP	02/14/01 1025	WQ	1	TIP_P, TP_P	
P2-0669	PP-EB1-BP	02/14/01 1020	WQ	1	TP_P	
P2-0670	PP-EB2-BP	02/14/01 1020	WQ	1		

Sampled By:	Date / Time:	Custody Seal: Y / N	Relinquished By:	Date / Time:
Shipped Via: UPS FedEx Hand Other (please specify):				
Received By:	Date / Time:	Cooler Temp:	Relinquished By:	Date / Time:
Received By:	Date / Time:	Cooler Temp:	Relinquished By:	Date / Time:

Remarks:

CH2M HILL  
Chain of Custody Form  
PSTA

COC Number:

P248

Project:

148010.01.05.CH

HYTON-BASED STORMWATER TREATMENT AREA (PSTA) RESEARCH AND DEMONSTRATION PR

Kit Request ID:

Lab: IFAS

Laboratory Coordinator: Ellen Patterson / USA 954.426.6112 x233

Sample ID	Station ID	Date & Time Collected	Matrix	Number of Containers	Analysis Requested	Comments
P2-0624	PP-3-WP	02/13/01	PP	1	TIP_P, TP_P	
P2-0625	PP-3-WP	1325	PP	1	TP_P	
P2-0626	PP-5-WP	1553	PP	1	TIP_P, TP_P	
P2-0627	PP-5-WP	1555	PP	1	TP_P	
P2-0628	PP-10-WP	02/14/01	PP	1	TIP_P, TP_P	
P2-0629	PP-10-WP	1105	PP	1	TP_P	
P2-0630	PP-12-WP	1100	PP	1	TIP_P, TP_P	
P2-0631	PP-12-WP	1330	PP	1	TP_P	
P2-0632	PP-14-WP	02/15/01	PP	1	TIP_P, TP_P	
P2-0633	PP-14-WP	0945	PP	1	TP_P	
P2-0634	PP-17-WP	1205	PP	1	TIP_P, TP_P	
P2-0635	PP-17-WP	1205	PP	1	TP_P	
P2-0636	PP-19-WP	02/20/01	PP	1	TIP_P, TP_P	
P2-0637	PP-19-WP	1100	PP	1	TP_P	
P2-0638	PP-20-WP	1055	PP	1	TIP_P, TP_P	
P2-0639	PP-20-WP	1005	PP	1	TP_P	
P2-0640	PP-21-WP	02/20/01	PP	1	TIP_P, TP_P	
P2-0641	PP-21-WP	1545	PP	1	TP_P	
P2-0642	PP-22-WP	1605	PP	1	TIP_P, TP_P	
P2-0643	PP-22-WP	1600	PP	1	TP_P	
P2-0644	PP-FD1-WP	02/20/01	PP	1	TIP_P, TP_P	
P2-0645	PP-FD2-WP	02/20/01	PP	1	TP_P	
P2-0646	PP-EB1-WP	02/14/01	WQ	1	TIP_P, TP_P	
P2-0647	PP-EB2-WP	1024	WQ	1	TP_P	

Sampled By:	Date / Time:	Custody Seal: Y / N	Relinquished By:	Date / Time:
Shipped Via: UPS FedEx Hand Other (please specify):				
Received By:	Date / Time:	Cooler Temp:	Relinquished By:	Date / Time:
Received By:	Date / Time:	Cooler Temp:	Relinquished By:	Date / Time:

Remarks:

<b>COC Number:</b>	P251	<b>Project:</b>	HYTON-BASED STORMWATER TREATMENT AREA (PSTA) RESEARCH AND DEMONSTRATION PROJECT		<b>Kit Request ID:</b>	
<b>Project #:</b>	148010.01.05.CH		<b>Laboratory Coordinator:</b>	Ellen Patterson / USA 954.426.6112 x233	<b>Lab:</b>	IFAS

Sample ID	Station ID	Date & Time Collected		Matrix	Number of Containers	Analysis Requested	Comments
P2-0672	PP-3-UPR	02/14/01	0818	SD	1	TIP_SE, TP	
P2-0673	PP-3-UPR		0815	SD	1	TP_S	
P2-0674	PP-6-UPR		1042	SD	1	TIP_SE, TP	
P2-0675	PP-6-UPR		1040	SD	1	TP_S	
P2-0676	PP-10-UPR		1535	SD	1	TIP_SE, TP	
P2-0677	PP-10-UPR		1530	SD	1	TP_S	
P2-0678	PP-12-UPR		1745	SD	1	TIP_SE, TP	
P2-0679	PP-12-UPR		1740	SD	1	TP_S	
P2-0680	PP-14-UPR	02/15/01	1517	SD	1	TIP_SE, TP	
P2-0681	PP-14-UPR		1515	SD	1	TP_S	
P2-0682	PP-17-UPR		1437	SD	1	TIP_SE, TP	
P2-0683	PP-17-UPR		1435	SD	1	TP_S	
P2-0684	PP-19-UPR	02/13/01	1450	SD	1	TIP_SE, TP	
P2-0685	PP-19-UPR		1355	SD	1	TP_S	
P2-0686	PP-20-UPR		1035	SD	1	TIP_SE, TP	
P2-0687	PP-20-UPR		1036	SD	1	TP_S	
P2-0688	PP-FD1-UPR		1423	SD	1	TIP_SE, TP	
P2-0689	PP-FD2-UPR	02/14/01	0825	SD	1	TP_S	
P2-0690	PP-EB1-UPR			WQ	1	TIP_SE, TP	
P2-0691	PP-EB1-UPR		1135	WQ	1	TP_S	
P2-0692	PP-EB2-UPR		1154	WQ	1	TP_S	

Sampled By:	Date / Time:		Custody Seal: Y / N	Relinquished By:	Date / Time:
Shipped Via:	UPS	FedEx	Hand Other (please specify):		
Received By:	Date / Time:	Cooler Temp:	Custody Seal: Y / N	Relinquished By:	Date / Time:
Received By:	Date / Time:	Cooler Temp:	Custody Seal: Y / N	Relinquished By:	Date / Time:
Remarks:					

## Chain of Custody Form

PSTA

COC Number:	P257	Project:	HYTON-BASED STORMWATER TREATMENT AREA (PSTA) RESEARCH AND DEMONSTRATION PR	Kit Request ID:	
Project #:	148010.01.05.CH	Laboratory Coordinator:	Ellen Patterson / USA 954.426.6112 x233	Lab:	IFAS

Sample ID	Station ID	Date & Time Collected	Matrix	Number of Containers	Analysis Requested	Comments
P2-0741	PP-3-RTS	02/01/01	MC	1	TIP, TP_S	
P2-0742	PP-3-RTS	02/01/01	MC	1	TP_S	
P2-0743	PP-5-RTS	02/01/01	MC	1	TIP, TP_S	
P2-0744	PP-5-RTS	02/01/01	MC	1	TP_S	
P2-0745	PP-10-RTS	02/01/01	MC	1	TIP, TP_S	
P2-0746	PP-10-RTS	02/01/01	MC	1	TP_S	
P2-0747	PP-12-RTS	02/01/01	MC	1	TIP, TP_S	
P2-0748	PP-12-RTS	02/01/01	MC	1	TP_S	
P2-0749	PP-14-RTS	02/01/01	MC	1	TIP, TP_S	
P2-0750	PP-14-RTS	02/01/01	MC	1	TP_S	
P2-0751	PP-17-RTS	02/01/01	MC	1	TIP, TP_S	
P2-0752	PP-17-RTS	02/01/01	MC	1	TP_S	
P2-0753	PP-19-RTS	02/01/01	MC	1	TIP, TP_S	
P2-0754	PP-19-RTS	02/01/01	MC	1	TP_S	
P2-0755	PP-20-RTS	02/01/01	MC	1	TIP, TP_S	
P2-0756	PP-20-RTS	02/01/01	MC	1	TP_S	
P2-0757	PP-FD1-RTS	02/01/01	MC	1	TIP, TP_S	
P2-0758	PP-FD2-RTS	02/01/01	MC	1	TP_S	

Sampled By:	Date / Time:	Custody Seal: Y / N	Relinquished By:	Date / Time:
Shipped Via: UPS FedEx Hand Other (please specify):				
Received By:	Date / Time:	Cooler Temp:	Relinquished By:	Date / Time:
Received By:	Date / Time:	Cooler Temp:	Relinquished By:	Date / Time:
Remarks:				

CH2M HILL

## Chain of Custody Form

PSTA

COC Number:

P255

Project:

HYTON-BASED STORMWATER TREATMENT AREA (PSTA) RESEARCH AND DEMONSTRATION PR

Project #:

148010-01.05.CH

Laboratory Coordinator:

Ellen Patterson / USA 954.426.6112 x233

Kit Request ID:

Lab:

IFAS

Sample ID	Station ID	Date & Time Collected	Matrix	Number of Containers	Analysis Requested	Comments
P2-0723	PP-3-MAC	02/14/01 1220	MC	1	TIP, TP_S	
P2-0724	PP-3-MAC	1220	MC	1	TP_S	
P2-0725	PP-5-MAC	1405	MC	1	TIP, TP_S	
P2-0726	PP-5-MAC	1405	MC	1	TP_S	
P2-0727	PP-10-MAC	1601	MC	1	TIP, TP_S	
P2-0728	PP-10-MAC	1651	MC	1	TP_S	
P2-0729	PP-12-MAC	02/15/01 0855	MC	1	TIP, TP_S	
P2-0730	PP-12-MAC	0855	MC	1	TP_S	
P2-0731	PP-14-MAC	1620	MC	1	TIP, TP_S	
P2-0732	PP-14-MAC	1620	MC	1	TP_S	
P2-0733	PP-17-MAC	1650	MC	1	TIP, TP_S	
P2-0734	PP-17-MAC	1650	MC	1	TP_S	
P2-0735	PP-19-MAC	02/14/01 0855	MC	1	TIP, TP_S	
P2-0736	PP-19-MAC	0855	MC	1	TP_S	
P2-0737	PP-20-MAC	02/13/01 1150	MC	1	TIP, TP_S	
P2-0738	PP-20-MAC	02/13/01 1150	MC	1	TP_S	
P2-0739	PP-FD1-MAC	02/14/01 0900	MC	1	TIP, TP_S	
P2-0740	PP-FD2-MAC	02/14/01 1220	MC	1	TP_S	

Sampled By:	Date / Time:	Custody Seal: Y / N	Relinquished By:	Date / Time:
Shipped Via: UPS FedEx Hand Other (please specify):				
Received By:	Date / Time:	Cooler Temp:	Relinquished By:	Date / Time:
Received By:	Date / Time:	Cooler Temp:	Relinquished By:	Date / Time:
Remarks:				



**Field Sheet**  
**Porta-PSTA Monitoring**  
**Periphyton-Based Stormwater Treatment Area (PSTA) Project**

148010.P2.06.CH

Porta-PSTA:	①	2	3	4	5	6	7	8	
	9	10	11	12	13	14	15	16	
	17	18	19	20	21	22	23	24	Head Tank

Type of Monitoring: Weekly      Monthly      Quarterly      Date: 02/20/

Field Team: low, FB, cx      (See page 1 unless otherwise noted)

Weather Conditions: mostly sunny      (See page 1 unless otherwise noted)

<u>Field Measurements:</u>	Minisonde # <u>2</u>	Staff <u>24</u>	
	<u>Inflow</u>	<u>Center (NA)</u>	<u>Outflow</u>
Time:	<u>10:21</u>		<u>10:24 5:14</u>
D.O., mg/L	<u>3.44</u>		<u>56.4 514</u>
% DO Saturation:	<u>39.4</u>		<u>56.4</u>
Temperature, °C:	<u>21.61</u>		<u>21.29</u>
pH	<u>7.21</u>		<u>7.31</u>
Conductivity ms/cm	<u>1.245</u>		<u>1.248</u>
TDS, g/L	<u>0.7941</u>		<u>0.7984</u>
Sampling Location:	Mid-depth at inflow	Mid-depth at center of tank	Mid-depth at outflow

<u>Water Quality Samples:</u>	<u>Inflow (NA)</u>	<u>Center (NA)</u>	<u>Outflow</u>
Sample Time:			<u>10:09</u>
Sampling Location:	Inflow pipe	Mid-depth at center of tank	Outflow pipe

QA/QC Samples:	<u>Duplicate</u>	<u>Equip. blank</u>	<u>None</u>
Location:	Infl   Cntr   Outfl	NA	
Sample Time:			
Sample ID:	PP -      - W	PP -      - W	

Comments: \_\_\_\_\_

Notetaker Signature: [Signature]

**Field Sheet**  
**Porta-PSTA Monitoring**  
**Periphyton-Based Stormwater Treatment Area (PSTA) Project**

148010.P2.06.CH

Porta-PSTA:	1	2	3	4	5	6	7	8	
	9	10	11	12	13	14	15	16	
	17	18	19	20	21	22	23	24	Head Tank

Type of Monitoring: Weekly Monthly Quarterly Date : 02.12.01  
 Field Team: \_\_\_\_\_ (See page 1 unless otherwise noted)  
 Weather Conditions: \_\_\_\_\_ (See page 1 unless otherwise noted)

**Field Measurements:**

	Minisonde #	Staff
	<u>2</u>	<u>21.4</u>
	<u>Inflow</u>	<u>Center (NA)</u>
Time:	<u>1026</u>	<u>1028</u>
D.O., mg/L	<u>4.10</u>	<u>2.96</u>
% DO Saturation:	<u>47.1</u>	<u>33.4</u>
Temperature, °C:	<u>21.89</u>	<u>21.16</u>
pH	<u>7.28</u>	<u>7.33</u>
Conductivity ms/cm	<u>1.257</u>	<u>1.162</u>
TDS, g/L	<u>0.8051</u>	<u>0.7488</u>
Sampling Location:	Mid-depth at inflow	Mid-depth at center of tank

**Water Quality Samples:**

	<u>Inflow (NA)</u>	<u>Center (NA)</u>	<u>Outflow</u>
Sample Time:	_____	_____	<u>1009</u>
Sampling Location:	Inflow pipe	Mid-depth at center of tank	Outflow pipe

**QA/QC Samples:**

	<u>Duplicate</u>	<u>Equip. blank</u>	<u>None</u>
Location:	Infl Cntr Outfl	NA	
Sample Time:	_____	_____	
Sample ID:	PP - - W	PP - - W	

Comments: \_\_\_\_\_

Notetaker Signature: \_\_\_\_\_

**Field Sheet**  
**Porta-PSTA Monitoring**  
**Periphyton-Based Stormwater Treatment Area (PSTA) Project**

148010.P2.06.CH

Porta-PSTA:	1	2	3	4	5	6	7	8	
	9	10	11	12	13	14	15	16	
	17	18	19	20	21	22	23	24	Head Tank

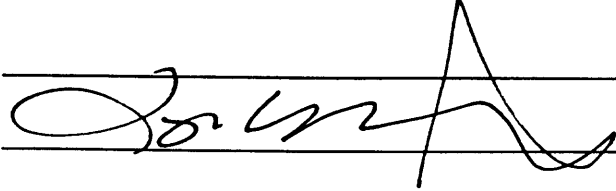
Type of Monitoring:      Weekly      Monthly      Quarterly      Date : \_\_\_\_\_  
 Field Team: \_\_\_\_\_ (See page 1 unless otherwise noted)  
 Weather Conditions: \_\_\_\_\_ (See page 1 unless otherwise noted)

<u>Field Measurements:</u>	Minisonde # <u>2</u>	Staff <u>23</u>	
	<u>Inflow</u>	<u>Center (NA)</u>	<u>Outflow</u>
Time:	<u>1029</u>		<u>1031</u>
D.O., mg/L	<u>4.33</u>		<u>5.37</u>
% DO Saturation:	<u>49.6</u>		<u>61.5</u>
Temperature, °C:	<u>21.98</u>		<u>21.77</u>
pH	<u>7.31</u>		<u>7.34</u>
Conductivity ms/cm	<u>1.143</u>		<u>1.170</u>
TDS, g/L	<u>0.7340</u>		<u>0.7503</u>
Sampling Location:	Mid-depth at inflow	Mid-depth at center of tank	Mid-depth at outflow

<u>Water Quality Samples:</u>	<u>Inflow (NA)</u>	<u>Center (NA)</u>	<u>Outflow</u>
Sample Time:			<u>1005</u>
Sampling Location:	Inflow pipe	Mid-depth at center of tank	Outflow pipe

QA/QC Samples:	<u>Duplicate</u>	<u>Equip. blank</u>	<u>None</u>
Location:	Infl Cntr Outfl	NA	
Sample Time:			
Sample ID:	PP -      - W	PP -      - W	

Comments: \_\_\_\_\_

Notetaker Signature: 

**Field Sheet**  
**Porta-PSTA Monitoring**  
**Periphyton-Based Stormwater Treatment Area (PSTA) Project**

148010.P2.06.CH

Porta-PSTA:	1	2	3	④	5	6	7	8
	9	10	11	12	13	14	15	16
	17	18	19	20	21	22	23	24
								Head Tank

Type of Monitoring: Weekly Monthly Quarterly Date : \_\_\_\_\_

Field Team: \_\_\_\_\_ (See page 1 unless otherwise noted)

Weather Conditions: \_\_\_\_\_ (See page 1 unless otherwise noted)

<u>Field Measurements:</u>	Minisonde #	<u>2</u>	Staff	<u>24</u>
	<u>Inflow</u>	<u>Center (NA)</u>	<u>Outflow</u>	
Time:	<u>10:33</u>		<u>10:35</u>	
D.O., mg/L	<u>5.23</u>		<u>5.49</u>	
% DO Saturation:	<u>60.7</u>		<u>62.3</u>	
Temperature, °C:	<u>22.23</u>		<u>21.38</u>	
pH	<u>7.32</u>		<u>7.45</u>	
Conductivity ms/cm	<u>1.075</u>		<u>1.060</u>	
TDS, g/L	<u>0.683</u>		<u>0.6765</u>	
Sampling Location:	Mid-depth at inflow	Mid-depth at center of tank	Mid-depth at outflow	

<u>Water Quality Samples:</u>	<u>Inflow (NA)</u>	<u>Center (NA)</u>	<u>Outflow</u>
Sample Time:			<u>1010</u>
Sampling Location:	Inflow pipe	Mid-depth at center of tank	Outflow pipe

<u>QA/QC Samples:</u>	<u>Duplicate</u>	<u>Equip. blank</u>	<u>None</u>
Location:	Infl Cntr Outfl	NA	
Sample Time:			
Sample ID:	PP - - W	PP - - W	

Comments: \_\_\_\_\_

Notetaker Signature: Michelle Lutz

**Field Sheet**  
**Porta-PSTA Monitoring**  
**Periphyton-Based Stormwater Treatment Area (PSTA) Project**

148010.P2.06.CH

Porta-PSTA:	1	2	3	4	⑤	6	7	8	
	9	10	11	12	13	14	15	16	
	17	18	19	20	21	22	23	24	Head Tank

Type of Monitoring:      Weekly                      Monthly                      Quarterly

Date : 2.12.01

Field Team: \_\_\_\_\_

(See page 1 unless otherwise noted)

Weather Conditions: \_\_\_\_\_

(See page 1 unless otherwise noted)

Field Measurements:

Minisonde #

2

Staff

13

Time:

InflowCenter (NA)Outflow

D.O., mg/L

10:504.0010:554.84

% DO Saturation:

45.755.4

Temperature, °C:

21.4021.74

pH

7.397.39

Conductivity ms/cm

1.2001.211

TDS, g/L

0.77170.7767

Sampling Location:

Mid-depth  
at inflowMid-depth  
at center of tankMid-depth  
at outflowWater Quality Samples:Inflow (NA)Center (NA)Outflow

Sample Time:

1010

Sampling Location:

Inflow pipe

Mid-depth  
at center of tank

Outflow pipe

QA/QC Samples:

DuplicateEquip. blankNone

Location:

Infl Cntr Outfl

NA

Sample Time:

Sample ID:

PP -            - W

PP -            - W

Comments: \_\_\_\_\_

Notetaker Signature: \_\_\_\_\_

Michelle Layton

**Field Sheet**  
**Porta-PSTA Monitoring**  
**Periphyton-Based Stormwater Treatment Area (PSTA) Project**

148010.P2.06.CH

Porta-PSTA:	1	2	3	4	5	⑥	7	8	
	9	10	11	12	13	14	15	16	
	17	18	19	20	21	22	23	24	Head Tank

Type of Monitoring:      Weekly                      Monthly                      Quarterly                      Date : 2.12.01  
 Field Team: \_\_\_\_\_ (See page 1 unless otherwise noted)  
 Weather Conditions: \_\_\_\_\_ (See page 1 unless otherwise noted)

<u>Field Measurements:</u>	Minisonde # <u>2</u>	Staff <u>24½</u>	
	<u>Inflow</u>	<u>Center (NA)</u>	<u>Outflow</u>
Time:	<u>11:00</u>	_____	<u>11:05</u>
D.O., mg/L	<u>1.86</u>	_____	<u>5.00</u>
% DO Saturation:	<u>21.1</u>	_____	<u>56.9</u>
Temperature, °C:	<u>21.12</u>	_____	<u>21.56</u>
pH	<u>7.32</u>	_____	<u>7.58</u>
Conductivity ms/cm	<u>1.237</u>	_____	<u>1.220</u>
TDS, g/L	<u>0.7915</u>	_____	<u>0.7865</u>
Sampling Location:	Mid-depth at inflow	Mid-depth at center of tank	Mid-depth at outflow

<u>Water Quality Samples:</u>	<u>Inflow (NA)</u>	<u>Center (NA)</u>	<u>Outflow</u>
Sample Time:	_____	_____	<u>1015</u>
Sampling Location:	Inflow pipe	Mid-depth at center of tank	Outflow pipe

QA/QC Samples:	<u>Duplicate</u>	<u>Equip. blank</u>	<u>None</u>
Location:	Infl   Cntr <u>Outfl</u>	NA	
Sample Time:	<u>1050</u>	_____	
Sample ID:	PP - <u>FD1</u> - W	PP - _____ - W	

Comments: \_\_\_\_\_

Notetaker Signature: Mickelle Laph

**Field Sheet**  
**Porta-PSTA Monitoring**  
**Periphyton-Based Stormwater Treatment Area (PSTA) Project**

148010.P2.06.CH

Porta-PSTA:	1	2	3	4	5	6	7	8
	9	10	11	12	13	14	15	16
	17	18	19	20	21	22	23	24      Head Tank

Type of Monitoring:      Weekly      Monthly      Quarterly      Date : 2-12-01  
 Field Team: \_\_\_\_\_ (See page 1 unless otherwise noted)  
 Weather Conditions: \_\_\_\_\_ (See page 1 unless otherwise noted)

**Field Measurements:**      Minisonde # 2      Staff 12

	<u>Inflow</u>	<u>Center (NA)</u>	<u>Outflow</u>
Time:	<u>11:10</u>		<u>11:15</u>
D.O., mg/L	<u>4.17</u>		<u>4.60</u>
% DO Saturation:	<u>48.4</u>		<u>52.3</u>
Temperature, °C:	<u>22.63</u>		<u>21.46</u>
pH	<u>7.48</u>		<u>7.57</u>
Conductivity ms/cm	<u>1.210</u>		<u>1.186</u>
TDS, g/L	<u>0.7742</u>		<u>0.7605</u>
Sampling Location:	Mid-depth at inflow	Mid-depth at center of tank	Mid-depth at outflow

**Water Quality Samples:**

	<u>Inflow (NA)</u>	<u>Center (NA)</u>	<u>Outflow</u>
Sample Time:			<u>1015</u>
Sampling Location:	Inflow pipe	Mid-depth at center of tank	Outflow pipe

**QA/QC Samples:**      Duplicate      Equip. blank      None

	<u>Infl</u>	<u>Cntr</u>	<u>Outfl</u>
Location:		<u>NA</u>	
Sample Time:			
Sample ID:	<u>PP -</u>	<u>- W</u>	<u>PP -</u>
		<u>- W</u>	

Comments: \_\_\_\_\_

Notetaker Signature: \_\_\_\_\_

Michelle Layt

**Field Sheet**  
**Porta-PSTA Monitoring**  
**Periphyton-Based Stormwater Treatment Area (PSTA) Project**

148010.P2.06.CH

Porta-PSTA:	1	2	3	4	5	6	7	⑧
	9	10	11	12	13	14	15	16
	17	18	19	20	21	22	23	24
								Head Tank

Type of Monitoring:      Weekly                      Monthly                      Quarterly

Date : 2.12.01

Field Team: \_\_\_\_\_

(See page 1 unless otherwise noted)

Weather Conditions: \_\_\_\_\_

(See page 1 unless otherwise noted)

Field Measurements:

Minisonde #

2

Staff

12

Time:

InflowCenter (NA)Outflow11:1811:25

D.O., mg/L

3.313.81

% DO Saturation:

38.343.4

Temperature, °C:

22.2321.61

pH

7.467.47

Conductivity ms/cm

1.2221.210

TDS, g/L

0.78190.7747

Sampling Location:

Mid-depth  
at inflowMid-depth  
at center of tankMid-depth  
at outflowWater Quality Samples:Inflow (NA)Center (NA)Outflow

Sample Time:

1020

Sampling Location:

Inflow pipe

Mid-depth  
at center of tank

Outflow pipe

QA/QC Samples:

DuplicateEquip. blankNone

Location:

Infl Cntr OutflNA

Sample Time:

Sample ID:

PP - - WPP - - W

Comments: \_\_\_\_\_

Notetaker Signature:

Michelle Layton



**Field Sheet**  
**Porta-PSTA Monitoring**  
**Periphyton-Based Stormwater Treatment Area (PSTA) Project**

148010.P2.06.CH

Porta-PSTA:	1	2	3	4	5	6	7	8	
	⑨	10	11	12	13	14	15	16	
	17	18	19	20	21	22	23	24	Head Tank

Type of Monitoring:      Weekly                      Monthly                      Quarterly                      Date : 2.12.01  
 Field Team: \_\_\_\_\_ (See page 1 unless otherwise noted)  
 Weather Conditions: \_\_\_\_\_ (See page 1 unless otherwise noted)

<u>Field Measurements:</u>	Minisonde # <u>2</u>	Staff <u>12 1/2</u>	
	<u>Inflow</u>	<u>Center (NA)</u>	<u>Outflow</u>
Time:	<u>11:30</u>		<u>11:35</u>
D.O., mg/L	<u>2.33</u>		<u>4.10</u>
% DO Saturation:	<u>27.1</u>		<u>46.4</u>
Temperature, °C:	<u>22.54</u>		<u>21.27</u>
pH	<u>7.36</u>		<u>7.53</u>
Conductivity ms/cm	<u>1.224</u>		<u>1.11</u>
TDS, g/L	<u>0.7883</u>		<u>0.7255</u>
Sampling Location:	Mid-depth at inflow	Mid-depth at center of tank	Mid-depth at outflow

<u>Water Quality Samples:</u>	<u>Inflow (NA)</u>	<u>Center (NA)</u>	<u>Outflow</u>
Sample Time:			<u>1006</u>
Sampling Location:	Inflow pipe	Mid-depth at center of tank	Outflow pipe

QA/QC Samples:	<u>Duplicate</u>	<u>Equip. blank</u>	<u>None</u>
Location:	Infl   Cntr   Outfl	NA	
Sample Time:	<u>1004</u>		
Sample ID:	<u>PP - F02 - W</u>	<u>PP -       - W</u>	

Comments: \_\_\_\_\_

Notetaker Signature: Mickelle Layte

**Field Sheet**  
**Porta-PSTA Monitoring**  
**Periphyton-Based Stormwater Treatment Area (PSTA) Project**

148010.P2.06.CH

Porta-PSTA:	1	2	3	4	5	6	7	8	
	9	10	11	12	13	14	15	16	
	17	18	19	20	21	22	23	24	Head Tank

Type of Monitoring:      Weekly                      Monthly                      Quarterly                      Date : 2.12.01

Field Team: \_\_\_\_\_ (See page 1 unless otherwise noted)

Weather Conditions: \_\_\_\_\_ (See page 1 unless otherwise noted)

<u>Field Measurements:</u>	Minisonde # <u>2</u>	Staff <u>12 1/2</u>	
	<u>Inflow</u>	<u>Center (NA)</u>	<u>Outflow</u>
Time:	<u>11:40</u>		<u>11:43</u>
D.O., mg/L	<u>2.93</u>		<u>3.15</u>
% DO Saturation:	<u>33.9</u>		<u>35.9</u>
Temperature, °C:	<u>22.02</u>		<u>21.60</u>
pH	<u>7.38</u>		<u>7.40</u>
Conductivity ms/cm	<u>1.143</u>		<u>1.138</u>
TDS, g/L	<u>0.7051</u>		<u>0.7380</u>
Sampling Location:	Mid-depth at inflow	Mid-depth at center of tank	Mid-depth at outflow

<u>Water Quality Samples:</u>	<u>Inflow (NA)</u>	<u>Center (NA)</u>	<u>Outflow</u>
Sample Time:			<u>1009</u>
Sampling Location:	Inflow pipe	Mid-depth at center of tank	Outflow pipe

<u>QA/QC Samples:</u>	<u>Duplicate</u>	<u>Equip. blank</u>	<u>None</u>
Location:	Infl Cntr Outfl	NA	
Sample Time:			
Sample ID:	PP -          - W	PP -          - W	

Comments: \_\_\_\_\_

Notetaker Signature: Michelle Layton

**Field Sheet**  
**Porta-PSTA Monitoring**  
**Periphyton-Based Stormwater Treatment Area (PSTA) Project**

148010.P2.06.CH

Porta-PSTA:	1	2	3	4	5	6	7	8	
	9	10	11	12	13	14	15	16	
	17	18	19	20	21	22	23	24	Head Tank

Type of Monitoring:      Weekly                      Monthly                      Quarterly

Date: 2.12.01

Field Team: \_\_\_\_\_

(See page 1 unless otherwise noted)

Weather Conditions: \_\_\_\_\_

(See page 1 unless otherwise noted)

Field Measurements:

Minisonde #

2

Staff

11

Time:

InflowCenter (NA)Outflow11:4511:50

D.O., mg/L

2.853.19

% DO Saturation:

32.535.6

Temperature, °C:

21.7121.25

pH

7.387.41

Conductivity ms/cm

1.2261.075

TDS, g/L

0.78760.6980

Sampling Location:

Mid-depth  
at inflowMid-depth  
at center of tankMid-depth  
at outflowWater Quality Samples:Inflow (NA)Center (NA)Outflow

Sample Time:

1012

Sampling Location:

Inflow pipe

Mid-depth  
at center of tank

Outflow pipe

QA/QC Samples:

DuplicateEquip. blankNone

Location:

Infl Cntr Outfl

NA

Sample Time:

Sample ID:

PP - - W

PP - - W

Comments: \_\_\_\_\_

Notetaker Signature: \_\_\_\_\_

Michelle Lajt

**Field Sheet**  
**Porta-PSTA Monitoring**  
**Periphyton-Based Stormwater Treatment Area (PSTA) Project**

148010.P2.06.CH

Porta-PSTA:	1	2	3	4	5	6	7	8
	9	10	11	12	13	14	15	16
	17	18	19	20	21	22	23	24
								Head Tank

Type of Monitoring: Weekly Monthly Quarterly

Date : 2.12.01

Field Team: \_\_\_\_\_

(See page 1 unless otherwise noted)

Weather Conditions: \_\_\_\_\_

(See page 1 unless otherwise noted)

Field Measurements:

Minisonde #

2

Staff

11 1/2

Time:

Inflow  
11:55Center (NA)Outflow  
11:59

D.O., mg/L

3.41

2.40

% DO Saturation:

49.4

27.5

Temperature, °C:

22.31

22.06

pH

7.38

7.35

Conductivity ms/cm

1.130

1.120

TDS, g/L

0.7421

0.7171

Sampling Location:

Mid-depth  
at inflowMid-depth  
at center of tankMid-depth  
at outflowWater Quality Samples:Inflow (NA)Center (NA)Outflow

Sample Time:

1015

Sampling Location:

Inflow pipe

Mid-depth  
at center of tank

Outflow pipe

QA/QC Samples:

DuplicateEquip. blankNone

Location:

Infl Cntr Outfl

NA

Sample Time:

Sample ID:

PP - - W

PP - - W

Comments: \_\_\_\_\_

Notetaker Signature:

Michelle Laph

**Field Sheet**  
**Porta-PSTA Monitoring**  
**Periphyton-Based Stormwater Treatment Area (PSTA) Project**

148010.P2.06.CH

Porta-PSTA:	1	2	3	4	5	6	7	8	
	9	10	11	12	13	14	15	16	
	17	18	19	20	21	22	23	24	Head Tank

Type of Monitoring:      Weekly                      Monthly                      Quarterly

Date : 2:12:01

Field Team: \_\_\_\_\_

(See page 1 unless otherwise noted)

Weather Conditions: \_\_\_\_\_

(See page 1 unless otherwise noted)

Field Measurements:

Minisonde #

2

Staff

12 1/2

Time:

InflowCenter (NA)Outflow12:0212:05

D.O., mg/L

4.303.40

% DO Saturation:

53.942.4

Temperature, °C:

26.6526.43

pH

7.277.31

Conductivity ms/cm

1.2531.266

TDS, g/L

0.80030.8090

Sampling Location:

Mid-depth  
at inflowMid-depth  
at center of tankMid-depth  
at outflowWater Quality Samples:Inflow (NA)Center (NA)Outflow

Sample Time:

1020

Sampling Location:

Inflow pipe

Mid-depth  
at center of tank

Outflow pipe

QA/QC Samples:

DuplicateEquip. blankNone

Location:

Infl Cntr OutflNA

Sample Time:

Sample ID:

PP - - WPP - - W

Comments: \_\_\_\_\_

Notetaker Signature: \_\_\_\_\_

Michelle Zapp

**Field Sheet**  
**Porta-PSTA Monitoring**  
**Periphyton-Based Stormwater Treatment Area (PSTA) Project**

148010.P2.06.CH

Porta-PSTA:	1	2	3	4	5	6	7	8
	9	10	11	12	13	14	15	16
	17	18	19	20	21	22	23	24
								Head Tank

Type of Monitoring:      Weekly                      Monthly                      Quarterly                      Date : 2.12.01

Field Team: \_\_\_\_\_ (See page 1 unless otherwise noted)

Weather Conditions: \_\_\_\_\_ (See page 1 unless otherwise noted)

<u>Field Measurements:</u>	Minisonde # <u>2</u>	Staff <u>12 1/2</u>
	<u>Inflow</u>	<u>Center (NA)</u>
Time:	<u>12:05</u>	<u>12:10</u>
D.O., mg/L	<u>2.34</u>	<u>3.62</u>
% DO Saturation:	<u>26.7</u>	<u>42.0</u>
Temperature, °C:	<u>21.93</u>	<u>22.33</u>
pH	<u>7.33</u>	<u>7.37</u>
Conductivity ms/cm	<u>1.088</u>	<u>1.252</u>
TDS, g/L	<u>0.6964</u>	<u>0.8012</u>
Sampling Location:	Mid-depth at inflow	Mid-depth at center of tank

<u>Water Quality Samples:</u>	<u>Inflow (NA)</u>	<u>Center (NA)</u>	<u>Outflow</u>
Sample Time:	_____	_____	<u>1020</u>
Sampling Location:	Inflow pipe	Mid-depth at center of tank	Outflow pipe

<u>QA/QC Samples:</u>	<u>Duplicate</u>	<u>Equip. blank</u>	<u>None</u>
Location:	Infl Cntr Outfl	NA	
Sample Time:	_____	_____	
Sample ID:	PP -      - W	PP -      - W	

Comments: \_\_\_\_\_

Notetaker Signature: Michelle Kaye

**Field Sheet**  
**Porta-PSTA Monitoring**  
**Periphyton-Based Stormwater Treatment Area (PSTA) Project**

148010.P2.06.CH

<b>Porta-PSTA:</b>	1	2	3	4	5	6	7	8
	9	10	11	12	13	14	15	16
	17	18	19	20	21	22	23	24 <b>Head Tank</b>

<b>Type of Monitoring:</b>	Weekly	Monthly	Quarterly	<b>Date :</b> <u>2.12.01</u>
<b>Field Team:</b>	(See page 1 unless otherwise noted)			
<b>Weather Conditions:</b>	(See page 1 unless otherwise noted)			

<b>Field Measurements:</b>	<b>Minisonde #</b>	<u>2</u>	<b>Staff</b>	<u>23</u>
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	<u><b>Inflow</b></u>	<u><b>Center (NA)</b></u>	<u><b>Outflow</b></u>
<b>Time:</b>	<u>12:15</u>		<u>12:20</u>
<b>D.O., mg/L</b>	<u>3.23</u>		<u>1.75</u>
<b>% DO Saturation:</b>	<u>38.0</u>		<u>19.2</u>
<b>Temperature, °C:</b>	<u>23.22</u>		<u>21.45</u>
<b>pH</b>	<u>7.36</u>		<u>7.35</u>
<b>Conductivity ms/cm</b>	<u>1.208</u>		<u>1.165</u>
<b>TDS, g/L</b>	<u>0.7565</u>		<u>0.7690</u>

<b>Sampling Location:</b>	Mid-depth at inflow	Mid-depth at center of tank	Mid-depth at outflow
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<b>Water Quality Samples:</b>	<u><b>Inflow (NA)</b></u>	<u><b>Center (NA)</b></u>	<u><b>Outflow</b></u>
<b>Sample Time:</b>			<u>1018</u>
<b>Sampling Location:</b>	Inflow pipe	Mid-depth at center of tank	Outflow pipe

<b>QA/QC Samples:</b>	<u><b>Duplicate</b></u>	<u><b>Equip. blank</b></u>	<u><b>None</b></u>
<b>Location:</b>	<u>Infl Cntr Outfl</u>	<u>NA</u>	
<b>Sample Time:</b>			
<b>Sample ID:</b>	<u>PP -      - W</u>	<u>PP -      - W</u>	

Comments: \_\_\_\_\_

Notetaker Signature: \_\_\_\_\_

Michelle Layt

**Field Sheet**  
**Porta-PSTA Monitoring**  
**Periphyton-Based Stormwater Treatment Area (PSTA) Project**

148010.P2.06.CH

Porta-PSTA:	1	2	3	4	5	6	7	8	
	9	10	11	12	13	14	15	16	
	17	18	19	20	21	22	23	24	Head Tank

Type of Monitoring:      Weekly                      Monthly                      Quarterly

Date : 2.12.01

Field Team: \_\_\_\_\_

(See page 1 unless otherwise noted)

Weather Conditions: \_\_\_\_\_

(See page 1 unless otherwise noted)

Field Measurements:

Minisonde #

2

Staff

13

Time:

InflowCenter (NA)Outflow12:0012:05

D.O., mg/L

2.512.01

% DO Saturation:

31.025.0

Temperature, °C:

25.9326.18

pH

7.227.23

Conductivity ms/cm

1.1471.224

TDS, g/L

0.73430.7825

Sampling Location:

Mid-depth  
at inflowMid-depth  
at center of tankMid-depth  
at outflowWater Quality Samples:Inflow (NA)Center (NA)Outflow

Sample Time:

1035

Sampling Location:

Inflow pipe

Mid-depth  
at center of tank

Outflow pipe

QA/QC Samples:

DuplicateEquip. blankNone

Location:

Infl Cntr Outfl

NA

Sample Time:

Sample ID:

PP - - W

PP - - W

Comments: \_\_\_\_\_

Notetaker Signature:

Michelle Lafta



Field Sheet  
ENR South Test Cells Monitoring  
Periphyton-Based Stormwater Treatment Area (PSTA) Project  
148010.01.04.CH

Porta-PSTA 17

Monitoring Location: Head Cell

Type of Monitoring: Weekly Monthly Quarterly

Field Team: \_\_\_\_\_

(See page 1 unless otherwise noted)

Weather Conditions: \_\_\_\_\_

(See page 1 unless otherwise noted)

Date: \_\_\_\_\_

Field Measurements:

Minisonde #

3

Total depth, ft:

23 1/4

Time:

Inflow  
11:57

Mid-depth

outflow  
12:02

Sampling depth, ft:

Dissolved Oxygen, mg/L:

3.22

5.49

% DO Saturation:

16.9

62.8

Temperature, °C:

21.43

22.00

pH, SU:

7.83

7.46

Conductivity, mS/cm:

1.246

1.261

TDS, g/L

0.7983

0.8072

Water Quality Samples:

Sample Time:

Sampling depth, ft:

QA/QC Samples:

DuplicateEquip. blankNone

Location:

out

NA

Sample Time:

1035

Sample ID:

PB- -W

TC- -W

PP-FD3-W

Comments:

Notetaker Signature



Field Sheet  
ENR South Test Cells Monitoring  
Periphyton-Based Stormwater Treatment Area (PSTA) Project  
148010.01.04.CH

Porto - PSTA 18

Monitoring Location: ~~WATER~~ ~~3~~ Head cell.

Type of Monitoring: Weekly Monthly Quarterly

Field Team: \_\_\_\_\_

(See page 1 unless otherwise noted)

Weather Conditions: \_\_\_\_\_

(See page 1 unless otherwise noted)

Date: \_\_\_\_\_

Field Measurements:

Minisonde #

3

Total depth, ft:

23

Time:

inf/ow  
11:49

Mid-depth

outflow  
11:49

Sampling depth, ft:

Dissolved Oxygen, mg/L:

% DO Saturation:

Temperature, °C:

pH, SU:

Conductivity, mS/cm:

TDS, g/L

2.38  
26.9  
21.51  
7.35  
1.242  
0.7952

6.40  
93.9  
21.51  
7.59  
1.252  
0.7889

Water Quality Samples:

Sample Time:

1030

Sampling depth, ft:

0.5

QA/QC Samples:

Duplicate

Equip. blank

None

Location:

NA

Sample Time:

Sample ID:

TC - - W

TC - - W

Comments:

Notetaker Signature:

[Signature]

**Field Sheet**  
**Porta-PSTA Monitoring**  
**Periphyton-Based Stormwater Treatment Area (PSTA) Project**

148010.P2.06.CH

Porta-PSTA:	1	2	3	4	5	6	7	8	
	9	10	11	12	13	14	15	16	
	17	18	19	20	21	22	23	24	Head Tank

Type of Monitoring:	Weekly	Monthly	Quarterly	Date : _____
Field Team:	_____			(See page 1 unless otherwise noted)
Weather Conditions:	_____			(See page 1 unless otherwise noted)

<u>Field Measurements:</u>	Minisonde #	<b>3</b>	Staff	<b>22</b>	
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	<u>Inflow</u>	<u>Center (NA)</u>	<u>Outflow</u>
Time:	<b>11:34</b>		<b>11:39</b>
D.O., mg/L	<b>4.33</b>		<b>5.93</b>
% DO Saturation:	<b>53.5</b>		<b>68.1</b>
Temperature, °C:	<b>21.58</b>		<b>21.69</b>
pH	<b>7.46</b>		<b>7.53</b>
Conductivity ms/cm	<b>1.236</b>		<b>1.234</b>
TDS, g/L	<b>0.7915</b>		<b>0.7897</b>
Sampling Location:	Mid-depth at inflow	Mid-depth at center of tank	Mid-depth at outflow


<u>Water Quality Samples:</u>	<u>Inflow (NA)</u>	<u>Center (NA)</u>	<u>Outflow</u>
Sample Time:	_____	_____	<b>1030</b>
Sampling Location:	Inflow pipe	Mid-depth at center of tank	Outflow pipe

QA/QC Samples:	<u>Duplicate</u>	<u>Equip. blank</u>	<u>None</u>
Location:	Infl Cntr Outfl	NA	
Sample Time:	_____	_____	
Sample ID:	PP -      - W	PP -      - W	

Comments: \_\_\_\_\_

Notetaker Signature: 

**Field Sheet**  
**Porta-PSTA Monitoring**  
**Periphyton-Based Stormwater Treatment Area (PSTA) Project**

148010.P2.06.CH

Porta-PSTA:	1	2	3	4	5	6	7	8
	9	10	11	12	13	14	15	16
	17	18	19	20	21	22	23	24
								Head Tank

**Type of Monitoring:**      Weekly                  Monthly                  Quarterly                  Date : \_\_\_\_\_  
**Field Team:** \_\_\_\_\_ (See page 1 unless otherwise noted)  
**Weather Conditions:** \_\_\_\_\_ (See page 1 unless otherwise noted)

**Field Measurements:**

Minisonde #

**3**

Staff

**25 3/4**

	<u>Inflow</u>	<u>Center (NA)</u>	<u>Outflow</u>
Time:	<b>11:26</b>		<b>11:30</b>
D.O., mg/L	<b>6.27</b>		<b>7.42</b>
% DO Saturation:	<b>31.9</b>		<b>86.8</b>
Temperature, °C:	<b>21.30</b>		<b>21.38</b>
pH	<b>7.56</b>		<b>7.75</b>
Conductivity ms/cm	<b>1.219</b>		<b>1.219</b>
TDS, g/L	<b>0.7802</b>		<b>0.7771</b>
<b>Sampling Location:</b>	Mid-depth at inflow	Mid-depth at center of tank	Mid-depth at outflow

**Water Quality Samples:**

	<u>Inflow (NA)</u>	<u>Center (NA)</u>	<u>Outflow</u>
Sample Time:			<b>1025</b>
Sampling Location:	Inflow pipe	Mid-depth at center of tank	Outflow pipe

<b>QA/QC Samples:</b>	<u>Duplicate</u>	<u>Equip. blank</u>	<u>None</u>
Location:	<u>Infl Cntr Outfl</u>	<u>NA</u>	
Sample Time:			
Sample ID:	<u>PP - - W</u>	<u>PP - - W</u>	

**Comments:** \_\_\_\_\_

**Notetaker Signature:**  \_\_\_\_\_

**Field Sheet**  
**Porta-PSTA Monitoring**  
**Periphyton-Based Stormwater Treatment Area (PSTA) Project**

148010.P2.06.CH

Porta-PSTA:	1	2	3	4	5	6	7	8	
	9	10	11	12	13	14	15	16	
	17	18	19	20	21	22	23	24	Head Tank

Type of Monitoring: Weekly Monthly Quarterly Date : \_\_\_\_\_  
 Field Team: \_\_\_\_\_ (See page 1 unless otherwise noted)  
 Weather Conditions: \_\_\_\_\_ (See page 1 unless otherwise noted)

Field Measurements:

Minisonde #

**3**

Staff

**32 1/4**

Time:

Inflow

Center (NA)

Outflow

D.O., mg/L

% DO Saturation:

Temperature, °C:

pH

Conductivity ms/cm

TDS, g/L

Sampling Location:

Mid-depth  
at inflowMid-depth  
at center of tankMid-depth  
at outflowWater Quality Samples:Inflow (NA)Center (NA)Outflow

Sample Time:

Sampling Location:

Inflow pipe

Mid-depth  
at center of tank

Outflow pipe

QA/QC Samples:

DuplicateEquip. blankNone

Location:

Infl Cntr Outfl

NA

Sample Time:

Sample ID:

PP - - W

PP - - W

Comments: \_\_\_\_\_

Notetaker Signature: \_\_\_\_\_

**Field Sheet**  
**Porta-PSTA Monitoring**  
**Periphyton-Based Stormwater Treatment Area (PSTA) Project**

148010.P2.06.CH

Porta-PSTA:	1	2	3	4	5	6	7	8	
	9	10	11	12	13	14	15	16	
	17	18	19	20	21	22	23	24	Head Tank

Type of Monitoring:      Weekly                      Monthly                      Quarterly

Date : 2.12.01

(See page 1 unless otherwise noted)

Field Team: \_\_\_\_\_

Weather Conditions: \_\_\_\_\_

(See page 1 unless otherwise noted)

Field Measurements:

Minisonde #

3

Staff

31

Time:

D.O., mg/L

% DO Saturation:

Temperature, °C:

pH

Conductivity ms/cm

TDS, g/L

Sampling Location:

Mid-depth  
at inflowMid-depth  
at center of tankMid-depth  
at outflowWater Quality Samples:

Sample Time:

Sampling Location:

Inflow pipe

Mid-depth  
at center of tank

Outflow pipe

QA/QC Samples:

Location:

Sample Time:

Sample ID:

Inflow (NA)Center (NA)OutflowInfl Cntr OutflNAPP - - WPP - - W

Comments: \_\_\_\_\_

Notetaker Signature: \_\_\_\_\_

**Field Sheet**  
**Porta-PSTA Monitoring**  
**Periphyton-Based Stormwater Treatment Area (PSTA) Project**

148010.P2.06.CH

Porta-PSTA:	1	2	3	4	5	6	7	8
	9	10	11	12	13	14	15	16
	17	18	19	20	21	22	23	24
								Head Tank

Type of Monitoring:      Weekly                      Monthly                      Quarterly

Date : 2.12.01

Field Team: \_\_\_\_\_

(See page 1 unless otherwise noted)

Weather Conditions: \_\_\_\_\_

(See page 1 unless otherwise noted)

Field Measurements:

Minisonde #

3

Staff

20'3

Time:

InflowCenter (NA)Outflow

D.O., mg/L

% DO Saturation:

Temperature, °C:

pH

Conductivity ms/cm

TDS, g/L

Sampling Location:

Mid-depth  
at inflowMid-depth  
at center of tankMid-depth  
at outflowWater Quality Samples:Inflow (NA)Center (NA)Outflow

Sample Time:

Sampling Location:

Inflow pipe

Mid-depth  
at center of tank

Outflow pipe

QA/QC Samples:

DuplicateEquip. blankNone

Location:

Infl Cntr Outfl

NA

Sample Time:

Sample ID:

PP -            - W

PP -            - W

Comments: \_\_\_\_\_

Notetaker Signature: \_\_\_\_\_

**Field Sheet**  
**Porta-PSTA Monitoring**  
**Periphyton-Based Stormwater Treatment Area (PSTA) Project**

148010.P2.06.CH

Porta-PSTA:	1	2	3	4	5	6	7	8
	9	10	11	12	13	14	15	16
	17	18	19	20	21	22	23	24
								Head Tank

**Type of Monitoring:** Weekly Monthly Quarterly **Date :** \_\_\_\_\_  
**Field Team:** \_\_\_\_\_ (See page 1 unless otherwise noted)  
**Weather Conditions:** \_\_\_\_\_ (See page 1 unless otherwise noted)

**Field Measurements:**

Minisonde #

**3**

Staff

**24****Time:**InflowCenter (NA)Outflow**D.O., mg/L****% DO Saturation:****Temperature, °C:****pH****Conductivity ms/cm****TDS, g/L****Sampling Location:**Mid-depth  
at inflowMid-depth  
at center of tankMid-depth  
at outflow**Water Quality Samples:**Inflow (NA)Center (NA)Outflow**Sample Time:****Sampling Location:**

Inflow pipe

Mid-depth  
at center of tank

Outflow pipe

**QA/QC Samples:**DuplicateEquip. blankNone**Location:**

Infl Cntr Outfl

NA

**Sample Time:****Sample ID:**

PP - - W

PP - - W

**Comments:** \_\_\_\_\_**Notetaker Signature:** \_\_\_\_\_



Field Sheet  
ENR South Test Cells Monitoring  
Periphyton-Based Stormwater Treatment Area (PSTA) Project  
148010.01.04.CH

Head-tank

Monitoring Location: Head Cell

Type of Monitoring: Weekly Monthly Quarterly

Field Team: \_\_\_\_\_

(See page 1 unless otherwise noted)

Weather Conditions: \_\_\_\_\_

(See page 1 unless otherwise noted)

Date: \_\_\_\_\_

Field Measurements:

Minisonde # \_\_\_\_\_ Total depth, ft: \_\_\_\_\_

Time:

Sampling depth, ft:

Dissolved Oxygen, mg/L:

% DO Saturation:

Temperature, °C:

pH, SU:

Conductivity, mS/cm:

TDS, g/L

Surface

Mid-depth

Bottom

12:10

0.46

5.5

22.70

7.24

1.242

0.3983

Water Quality Samples:

Sample Time:

HT1 1000

HT2 1015

HT3 1040

Sampling depth, ft:

EB1 1050

QA/QC Samples:

DuplicateEquip. blankNone

Location:

NA

Sample Time:


Sample ID:

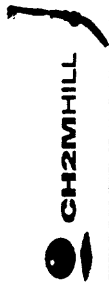
TC - - W

TC - - W

Comments: \_\_\_\_\_

Notetaker Signature: \_\_\_\_\_





FIELD INSTRUMENT CALIBRATION LOG

PROJECT 148010 P2.0409.CH

MiniSonde 1 (Serial No. 35412)

Pre-Calibration Readings

D.O. 7.56 mg/l  
D.O.% 89.4 %  
Temp 24.12 °C  
SpCond \_\_\_\_\_ ms/cm  
Temp \_\_\_\_\_ °C  
pH 7 \_\_\_\_\_  
pH 10 \_\_\_\_\_  
Temp \_\_\_\_\_ °C

Post-Calibration Readings

D.O. 8.31 mg/l  
D.O.% 100 %  
Temp 24.12 °C  
SpCond \_\_\_\_\_ ms/cm  
Temp \_\_\_\_\_ °C  
pH 7 \_\_\_\_\_  
pH 10 \_\_\_\_\_  
Temp \_\_\_\_\_ °C

MiniSonde 2 (Serial No. 35413)

Pre-Calibration Readings

D.O. 8.67 mg/l  
D.O.% 101.3 %  
Temp 23.12 °C  
SpCond 1.148 ms/cm  
Temp 23.12 °C  
pH 7 7.02  
pH 10 9.63  
Temp 23.12 °C

Post-Calibration Readings

D.O. 8.33 mg/l  
D.O.% 100.1 %  
Temp 23.24 °C  
SpCond 1.001 ms/cm  
Temp 23.26 °C  
pH 7 6.98  
pH 10 10.00  
Temp 23.24 °C

MiniSonde 3 (Serial No. 35414)

Pre-Calibration Readings

D.O. 7.56 mg/l  
D.O.% 89.4 %  
Temp 24.12 °C  
SpCond .9870 ms/cm  
Temp 24.12 °C  
pH 7 7.49  
pH 10 9.54  
Temp 24.12 °C

Post-Calibration Readings

D.O. 8.31 mg/l  
D.O.% 100 %  
Temp 24.56 °C  
SpCond 1.001 ms/cm  
Temp 24.12 °C  
pH 7 7.00  
pH 10 9.98  
Temp 24.12 °C

MiniSonde 4 (Serial No. 35415)

Pre-Calibration Readings

D.O. \_\_\_\_\_ mg/l  
D.O.% \_\_\_\_\_ %  
Temp \_\_\_\_\_ °C  
SpCond \_\_\_\_\_ ms/cm  
Temp \_\_\_\_\_ °C  
pH 7 \_\_\_\_\_  
pH 10 \_\_\_\_\_  
Temp \_\_\_\_\_ °C

Post-Calibration Readings

D.O. \_\_\_\_\_ mg/l  
D.O.% \_\_\_\_\_ %  
Temp \_\_\_\_\_ °C  
SpCond \_\_\_\_\_ ms/cm  
Temp \_\_\_\_\_ °C  
pH 7 \_\_\_\_\_  
pH 10 \_\_\_\_\_  
Temp \_\_\_\_\_ °C

MiniSonde 5 (Serial No. 35416)

Signed: \_\_\_\_\_

Date: 02.12.01

## PORTA-PSTA Inflow Calibration and Outflow Log

Date: 2/2/01All Inflows and Outflow Pipe Cleaned: Y or N

Tank	Start Time	Staff Gauge, In	Outflow Reading (mL/min)	Inflow Readings			End Time	Final Outflow (mL/min)	Final Outflow Time	Comments
				Actual Inflow (mL/min)	Flushed (Y/N)	Final Inflow (mL/min)				
1	0853	11 7/8	700	730	Y	840	0855			
2	0856	12 1/2	100	60		410	0900			
3	0900	13-	400	300		370	0902			
4	0903	12 1/4	350	300		400	0904			
5	0906	13-	50	50		450	0907			
6	0908	11 7/8	780	710		840	0910			
7	0911	12-	500	440		400	0912			
8	0912	7 7/8	500	400		440	0914			
9	0915	12 7/8	480	400		440	0916			
10	0916	12 3/4	300	280		440	0917			
11	0917	10 5/8	320	280		400	0920			
12	0918	11 1/2	30	70		400	0922			
13	0922	12 3/4	260	210		390	0924			
14	0925	12 7/8	180	160		380	0927			
15	0927	13-	840	700		740	0931			
16	0932	13 3/4	260	360		360	0934			
17	0934	12 1/4	300	280		410	0936			
18	0937	13-	380	380		440	0938			
19	0938	13 1/2	15	10		390	0940			
20	0945	10 1/4	100	60		420	0954			
21	0955	4-	300	280		440	0956			
22	0958	5 1/4	540	390		420	0958			
23	1004	15 1/2	940	900		1190	1008			
24	1010	12 1/8	820	800	Y	1210	1012			

Notetaker signature Edo

## Chain of Custody Form

PSTA

Generated on: 02/02/2001 4:44:33 PM

COC Number:	P261	Project:	HYTON-BASED STORMWATER TREATMENT AREA (PSTA) RESEARCH AND DEMONSTRATION PR	Kit Request ID:	
Project #:	148010.01.05.CH	Laboratory Coordinator:	Ellen Patterson / USA 954.426.6112 x233	Lab:	IFAS

Sample ID	Station ID	Date & Time Collected	Matrix	Number of Containers	Analysis Requested	Comments
P2-0793	PP-10OUT-W	02/12/01 10:09	WA	1	TP_W	
P2-0794	PP-20OUT-W	10:09	WA	1	TP_W	
P2-0795	PP-30OUT-W	10:05	WA	1	TP_W	
P2-0796	PP-40OUT-W	10:10	WA	1	TP_W	
P2-0797	PP-50OUT-W	10:10	WA	1	TP_W	
P2-0798	PP-60OUT-W	10:15	WA	1	TP_W	
P2-0799	PP-70OUT-W	10:15	WA	1	TP_W	
P2-0800	PP-80OUT-W	10:20	WA	1	TP_W	
P2-0801	PP-90OUT-W	10:06	WA	1	TP_W	
P2-0802	PP-100OUT-W	10:09	WA	1	TP_W	
P2-0803	PP-110OUT-W	10:12	WA	1	TP_W	
P2-0804	PP-120OUT-W	10:15	WA	1	TP_W	
P2-0805	PP-130OUT-W	10:20	WA	1	TP_W	
P2-0806	PP-140OUT-W	10:20	WA	1	TP_W	
P2-0807	PP-150OUT-W	10:18	WA	1	TP_W	
P2-0808	PP-160OUT-W	10:35	WA	1	TP_W	
P2-0809	PP-170OUT-W	10:35	WA	1	TP_W	
P2-0810	PP-180OUT-W	10:30	WA	1	TP_W	
P2-0811	PP-190OUT-W	10:30	WA	1	TP_W	
P2-0812	PP-200OUT-W	10:25	WA	1	TP_W	
P2-0813	PP-210OUT-W	10:25	WA	1	TP_W	
P2-0814	PP-220OUT-W	10:21	WA	1	TP_W	
P2-0815	PP-230OUT-W	10:20	WA	1	TP_W	
P2-0816	PP-240OUT-W	10:20	WA	1	TP_W	

Sampled By: <i>FB</i>	Date / Time: 02/12/01	Custody Seal: Y <input checked="" type="checkbox"/> N	Relinquished By: <i>FB</i>	Date / Time: 02/12/01
Shipped Via: UPS FedEx Hand Other (please specify):				
Received By:	Date / Time:	Cooler Temp:	Relinquished By:	Date / Time:
Received By:	Date / Time:	Cooler Temp:	Relinquished By:	Date / Time:
Remarks:				

Chain of Custody Form  
PSTA

COC Number:	P261	Project:	HYTON-BASED STORMWATER TREATMENT AREA (PSTA) RESEARCH AND DEMONSTRATION PR	Kit Request ID:	
Project #:	148010.01.05.CH	Laboratory Coordinator:	Ellen Patterson / USA 954.426.6112 x233	Lab:	IFAS

Sample ID	Station ID	Date & Time Collected	Matrix	Number of Containers	Analysis Requested	Comments
P2-0817	PP-HT1-W	02/12/01 10:00	WA	1	TP_W	
P2-0818	PP-HT2-W	10:15	WA	1	TP_W	
P2-0819	PP-HT3-W	10:40	WA	1	TP_W	
P2-0820	PP-FD1-W	10:50	WA	1	TP_W	
P2-0821	PP-FD2-W	10:04	WA	1	TP_W	
P2-0822	PP-FD3-W	10:35	WA	1	TP_W	
P2-0823	PP-EB1-W	10:50	WQ	1	TP_W	
P2-0824	PP-1OUT-W	10:59	WA	1	TDP_W	
P2-0825	PP-2OUT-W	10:09	WA	1	TDP_W	
P2-0826	PP-3OUT-W	10:05	WA	1	TDP_W	
P2-0827	PP-4OUT-W	10:10	WA	1	TDP_W	
P2-0828	PP-5OUT-W	10:10	WA	1	TDP_W	
P2-0829	PP-6OUT-W	10:15	WA	1	TDP_W	
P2-0830	PP-7OUT-W	10:15	WA	1	TDP_W	
P2-0831	PP-8OUT-W	10:20	WA	1	TDP_W	
P2-0832	PP-9OUT-W	10:06	WA	1	TDP_W	
P2-0833	PP-10OUT-W	10:09	WA	1	TDP_W	
P2-0834	PP-11OUT-W	10:12	WA	1	TDP_W	
P2-0835	PP-12OUT-W	10:15	WA	1	TDP_W	
P2-0836	PP-13OUT-W	10:20	WA	1	TDP_W	
P2-0837	PP-14OUT-W	10:25	WA	1	TDP_W	
P2-0838	PP-15OUT-W	10:18	WA	1	TDP_W	
P2-0839	PP-16OUT-W	10:35	WA	1	TDP_W	
P2-0840	PP-17OUT-W	10:35	WA	1	TDP_W	

Sampled By:	Date / Time:	Custody Seal: Y / N	Relinquished By:	Date / Time:
Shipped Via: UPS FedEx Hand Other (please specify):				
Received By:	Date / Time:	Cooler Temp:	Relinquished By:	Date / Time:
Received By:	Date / Time:	Cooler Temp:	Relinquished By:	Date / Time:
Remarks:				

## Chain of Custody Form

PSTA

COC Number:	P261	Project:	HYTON-BASED STORMWATER TREATMENT AREA (PSTA) RESEARCH AND DEMONSTRATION PR	Kit Request ID:	
Project #:	148010.01.05.CH	Laboratory Coordinator:	Ellen Patterson / USA 954.426.6112 x233	Lab:	IFAS

Sample ID	Station ID	Date & Time Collected	Matrix	Number of Containers	Analysis Requested	Comments
P2-0841	PP-18OUT-W	02/20/01 10:30	WA	1	TDP_W	
P2-0842	PP-19OUT-W	10:30	WA	1	TDP_W	
P2-0843	PP-20OUT-W	10:25	WA	1	TDP_W	
P2-0844	PP-21OUT-W	10:25	WA	1	TDP_W	
P2-0845	PP-22OUT-W	10:21	WA	1	TDP_W	
P2-0846	PP-23OUT-W	10:20	WA	1	TDP_W	
P2-0847	PP-24OUT-W	10:20	WA	1	TDP_W	
P2-0848	PP-HT1-W	10:00	WA	1	TDP_W	
P2-0849	PP-HT2-W	10:15	WA	1	TDP_W	
P2-0850	PP-HT3-W	10:40	WA	1	TDP_W	
P2-0851	PP-FD1-W	10:50	WA	1	TDP_W	
P2-0852	PP-FD2-W	10:04	WA	1	TDP_W	
P2-0853	PP-FD3-W	10:36	WA	1	TDP_W	
P2-0854	PP-EB1-W	10:50	WQ	1	TDP_W	
P2-0855	PP-10UT-W	10:09	WA	1	DRP	
P2-0856	PP-20UT-W	10:09	WA	1	DRP	
P2-0857	PP-30UT-W	10:05	WA	1	DRP	
P2-0858	PP-40UT-W	10:10	WA	1	DRP	
P2-0859	PP-50UT-W	10:10	WA	1	DRP	
P2-0860	PP-60UT-W	10:15	WA	1	DRP	
P2-0861	PP-70UT-W	10:15	WA	1	DRP	
P2-0862	PP-80UT-W	10:20	WA	1	DRP	
P2-0863	PP-90UT-W	10:06	WA	1	DRP	
P2-0864	PP-100UT-W	10:09	WA	1	DRP	

Sampled By:	Date / Time:	Custody Seal: Y / N	Relinquished By:	Date / Time:
Shipped Via:	UPS FedEx Hand Other (please specify):			
Received By:	Date / Time:	Cooler Temp:	Relinquished By:	Date / Time:
Received By:	Date / Time:	Cooler Temp:	Relinquished By:	Date / Time:
Remarks:				

## Chain of Custody Form

PSTA

COC Number:	P261	Project:	HYTON-BASED STORMWATER TREATMENT AREA (PSTA) RESEARCH AND DEMONSTRATION PR	Kit Request ID:	
Project #:	148010.01.05.CH	Laboratory Coordinator:	Ellen Patterson / USA 954.426.6112 x233	Lab:	IFAS

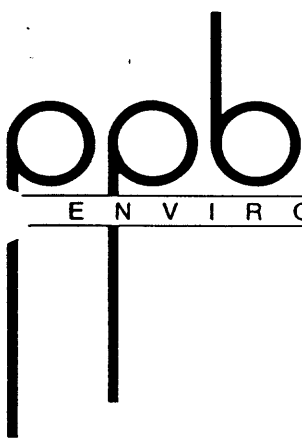
Sample ID	Station ID	Date & Time Collected	Matrix	Number of Containers	Analysis Requested	Comments
P2-0865	PP-11OUT-W	02/12/01 10:12	WA	1	DRP	
P2-0866	PP-12OUT-W	10:15	WA	1	DRP	
P2-0867	PP-13OUT-W	10:20	WA	1	DRP	
P2-0868	PP-14OUT-W	10:20	WA	1	DRP	
P2-0869	PP-15OUT-W	10:18	WA	1	DRP	
P2-0870	PP-16OUT-W	10:35	WA	1	DRP	
P2-0871	PP-17OUT-W	10:35	WA	1	DRP	
P2-0872	PP-18OUT-W	10:30	WA	1	DRP	
P2-0873	PP-19OUT-W	10:30	WA	1	DRP	
P2-0874	PP-20OUT-W	10:25	WA	1	DRP	
P2-0875	PP-21OUT-W	10:25	WA	1	DRP	
P2-0876	PP-22OUT-W	10:24	WA	1	DRP	
P2-0877	PP-23OUT-W	10:20	WA	1	DRP	
P2-0878	PP-24OUT-W	10:20	WA	1	DRP	
P2-0879	PP-HT1-W	10:00	WA	1	DRP	
P2-0880	PP-HT2-W	10:15	WA	1	DRP	
P2-0881	PP-HT3-W	10:40	WA	1	DRP	
P2-0882	PP-FD1-W	10:50	WA	1	DRP	
P2-0883	PP-FD2-W	10:04	WA	1	DRP	
P2-0884	PP-FD3-W	10:35	WA	1	DRP	
P2-0885	PP-EB1-W	10:50	WQ	1	DRP	

Sampled By:	Date / Time:	Custody Seal: Y / N	Relinquished By:	Date / Time:
Shipped Via: UPS FedEx Hand Other (please specify):				
Received By:	Date / Time:	Cooler Temp:	Relinquished By:	Date / Time:
Received By:	Date / Time:	Cooler Temp:	Relinquished By:	Date / Time:
Remarks:				

# PPB Lab Reports

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E N V I R O N M E N T A L   L A B O R A T O R I E S ,   I N C .

March 29, 2001

Ms. Ellen Patterson  
CH2M Hill  
800 Fairway Drive, Suite 350  
Deerfield Beach, FL 33441

Dear Ms. Patterson:

Enclosed are the analytical results for your destructive project samples received February 16, 2001. Samples for Bulk Density and Percent Solids were analyzed by Law Engineering, Jacksonville, Florida (CQAP #950024).

All data were determined in accordance with published procedures (EPA-600/4-79-020, *Methods for Chemical Analysis of Water and Wastes*, Revised May 1983 and/or *Standard Methods for the Examination of Water and Wastewater*, 18th edition, revised 1992). Our laboratory is certified by the Florida Department of Health (FDH No. E82001) and our CQAP is approved by FDEP (No. 870017G).

If you have any questions concerning this report, please contact me.

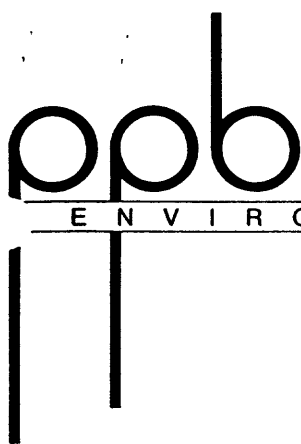
Sincerely,

A handwritten signature in cursive script that reads 'Paul Berman'.

Paul Berman  
Project Manager

PLB:cms

Enclosures



E N V I R O N M E N T A L   L A B O R A T O R I E S ,   I N C.

## CH2M Hill Case Narrative

A number of samples for ash free dry weight are qualified with a Q code. This is due to the fact that the samples initially required wet weight and dry weight analysis. The ash free dry weight analysis was analyzed from the dried sample and thus the date of analysis for ash free dry weight, although listed as a separate analysis, should actually be considered to be the same date of analysis as for wet weight.

Please contact me if you have any questions regarding this report.

Sincerely,

A handwritten signature in cursive script that reads 'Paul Berman'.

Paul Berman  
Project Manager



## REPORT OF ANALYSES

CH2M HILL  
800 FAIRWAY DRIVE  
SUITE 350  
DEERFIELD BEACH, FL 33441-  
Attn: MS ELLEN PATTERSON

DATE: 03/28/01  
FDH # E82001  
DEP CQAP # 870017G  
YOUR REF/P.O.: 148010

SAMPLES RECEIVED 2/16/01 (Page 1 of 14)

CLIENT STATION ID	LAB NUMBER	%SOLIDS %	WET WEIGHT g	DRY WEIGHT g	AFDW mg/L	BLK DNSTY G/CC	CA/T/ICP mg/L
PP-3-BP1	202489	N.R.	N.R.	N.R.	12800	N.R.	14200
PP-3-BP2	202490	N.R.	N.R.	N.R.	11800	N.R.	9560
PP-5-BP1	202491	N.R.	N.R.	N.R.	13900	N.R.	7670
PP-5-BP2	202492	N.R.	N.R.	N.R.	15600	N.R.	14900
PP-10-BP1	202493	N.R.	N.R.	N.R.	12400	N.R.	9500
PP-10-BP2	202494	N.R.	N.R.	N.R.	13900	N.R.	8960
PP-14-BP1	202495	N.R.	N.R.	N.R.	26800	N.R.	3830
PP-14-BP2	202496	N.R.	N.R.	N.R.	23500	N.R.	2260
PP-17-BP1	202497	N.R.	N.R.	N.R.	42900	N.R.	4990
PP-17-BP2	202498	N.R.	N.R.	N.R.	38200	N.R.	5620
PP-19-BP1	202499	N.R.	N.R.	N.R.	9590	N.R.	8260
PP-19-BP2	202500	N.R.	N.R.	N.R.	9860	N.R.	11200
PP-EB1-BP	202501	N.R.	N.R.	N.R.	12 U	N.R.	0.14
PP-EB2-BP	202502	N.R.	N.R.	N.R.	12 U	N.R.	0.14
PP-3-FP1	202503	N.R.	N.R.	N.R.	10800	N.R.	11700
PP-3-FP2	202504	N.R.	N.R.	N.R.	7660	N.R.	7800
PP-5-FP1	202505	N.R.	N.R.	N.R.	10800	N.R.	10200
PP-5-FP6	202506	N.R.	N.R.	N.R.	11000	N.R.	10600
PP-10-FP1	202507	N.R.	N.R.	N.R.	8940	N.R.	7760
PP-10-FP2	202508	N.R.	N.R.	N.R.	9480	N.R.	9950
PP-14-FP1	202509	N.R.	N.R.	N.R.	15000	N.R.	6650
PP-14-FP2	202510	N.R.	N.R.	N.R.	13200	N.R.	2310
PP-17-FP1	202511	N.R.	N.R.	N.R.	4390	N.R.	2090
PP-17-FP2	202512	N.R.	N.R.	N.R.	3740	N.R.	3530

U = Result below detection limit  
BUYER V WIDGREN

NOTE: N. R. = ANALYSIS NOT REQUIRED

PROJECT MANAGER

*Paul Berman*



## REPORT OF ANALYSES

CH2M HILL  
800 FAIRWAY DRIVE  
SUITE 350  
DEERFIELD BEACH, FL 33441-  
Attn: MS ELLEN PATTERSON

DATE: 03/28/01  
FDH # E82001  
DEP CQAP # 870017G  
YOUR REF/P.O.: 148010

SAMPLES RECEIVED 2/16/01 (Page 2 of 14)

CLIENT STATION ID	LAB NUMBER	CA/S/ICP mg/kg
PP-3-BP1	202489	N.R.
PP-3-BP2	202490	N.R.
PP-5-BP1	202491	N.R.
PP-5-BP2	202492	N.R.
PP-10-BP1	202493	N.R.
PP-10-BP2	202494	N.R.
PP-14-BP1	202495	N.R.
PP-14-BP2	202496	N.R.
PP-17-BP1	202497	N.R.
PP-17-BP2	202498	N.R.
PP-19-BP1	202499	N.R.
PP-19-BP2	202500	N.R.
PP-EB1-BP	202501	N.R.
PP-EB2-BP	202502	N.R.
PP-3-FP1	202503	N.R.
PP-3-FP2	202504	N.R.
PP-5-FP1	202505	N.R.
PP-5-FP6	202506	N.R.
PP-10-FP1	202507	N.R.
PP-10-FP2	202508	N.R.
PP-14-FP1	202509	N.R.
PP-14-FP2	202510	N.R.
PP-17-FP1	202511	N.R.
PP-17-FP2	202512	N.R.

BUYER V WIDGREN

NOTE: N. R. = ANALYSIS NOT REQUIRED

PROJECT MANAGER



## REPORT OF ANALYSES

CH2M HILL  
800 FAIRWAY DRIVE  
SUITE 350  
DEERFIELD BEACH, FL 33441-  
Attn: MS ELLEN PATTERSON

DATE: 03/28/01  
FDH # E82001  
DEP CQAP # 870017G  
YOUR REF/P.O.: 148010

SAMPLES RECEIVED 2/16/01 (Page 3 of 14)

CLIENT STATION ID	LAB NUMBER	%SOLIDS %	WET WEIGHT g	DRY WEIGHT g	AFDW mg/L	BLK DNSTY G/CC	CA/T/ICP mg/L
PP-EB1-FP	202513	N.R.	N.R.	N.R.	12 U	N.R.	0.40
PP-EB2-FP	202514	N.R.	N.R.	N.R.	12 U	N.R.	0.36
PP-3-WP1	202515	N.R.	N.R.	N.R.	14100	N.R.	12600
PP-3-WP2	202516	N.R.	N.R.	N.R.	12500	N.R.	26900
PP-5-WP1	202517	N.R.	N.R.	N.R.	11000	N.R.	12600
PP-5-WP2	202518	N.R.	N.R.	N.R.	13300	N.R.	11800
PP-10-WP1	202519	N.R.	N.R.	N.R.	18600	N.R.	16200
PP-10-WP2	202520	N.R.	N.R.	N.R.	16800	N.R.	17400
PP-12-WP1	202521	N.R.	N.R.	N.R.	9440	N.R.	7520
PP-12-WP2	202522	N.R.	N.R.	N.R.	11900	N.R.	11200
PP-14-WP1	202523	N.R.	N.R.	N.R.	23300	N.R.	9680
PP-14-WP2	202524	N.R.	N.R.	N.R.	21900	N.R.	9520
PP-17-WP1	202525	N.R.	N.R.	N.R.	6610	N.R.	2250
PP-17-WP2	202526	N.R.	N.R.	N.R.	14400	N.R.	11400
PP-19-WP1	202527	N.R.	N.R.	N.R.	17000	N.R.	18200
PP-19-WP2	202528	N.R.	N.R.	N.R.	16700	N.R.	15800
PP-20-WP2	202529	N.R.	N.R.	N.R.	778	N.R.	422
PP-FD1-WP2	202530	N.R.	N.R.	N.R.	676	N.R.	301
PP-EB1-WP	202531	N.R.	N.R.	N.R.	12 U	N.R.	0.44
PP-EB2-WP	202532	N.R.	N.R.	N.R.	12 U	N.R.	0.24
PP-3-CON	202533	N.R.	10.1545	0.3934 I	12000	N.R.	2920
PP-5-CON	202534	N.R.	10.110	0.1417 I	5090	N.R.	851
PP-10-CON	202535	N.R.	10.041	0.1518 I	9220	N.R.	2500
PP-12-CON	202536	N.R.	10.1690	0.6564	55800	N.R.	11000

I = Result between detection limit and practical quantitation limit

U = Result below detection limit

BUYER V WIDGREN

NOTE: N. R. = ANALYSIS NOT REQUIRED



E N V I R O N M E N T A L   L A B O R A T O R I E S ,   I N C.

REPORT OF ANALYSES

CH2M HILL  
800 FAIRWAY DRIVE  
SUITE 350  
DEERFIELD BEACH, FL 33441-  
Attn: MS ELLEN PATTERSON

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FDH # E82001  
DEP CQAP # 870017G  
YOUR REF/P.O.: 148010

SAMPLES RECEIVED 2/16/01 (Page 4 of 14)

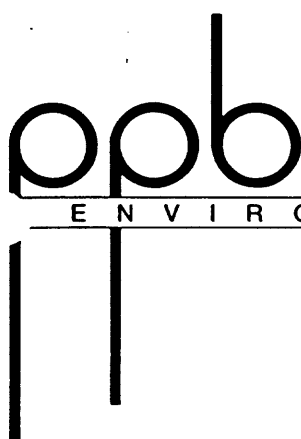
CLIENT STATION ID	LAB NUMBER	CA/S/ICP mg/kg
PP-EB1-FP	202513	N.R.
PP-EB2-FP	202514	N.R.
PP-3-WP1	202515	N.R.
PP-3-WP2	202516	N.R.
PP-5-WP1	202517	N.R.
PP-5-WP2	202518	N.R.
PP-10-WP1	202519	N.R.
PP-10-WP2	202520	N.R.
PP-12-WP1	202521	N.R.
PP-12-WP2	202522	N.R.
PP-14-WP1	202523	N.R.
PP-14-WP2	202524	N.R.
PP-17-WP1	202525	N.R.
PP-17-WP2	202526	N.R.
PP-19-WP1	202527	N.R.
PP-19-WP2	202528	N.R.
PP-20-WP2	202529	N.R.
PP-FD1-WP2	202530	N.R.
PP-EB1-WP	202531	N.R.
PP-EB2-WP	202532	N.R.
PP-3-CON	202533	N.R.
PP-5-CON	202534	N.R.
PP-10-CON	202535	N.R.
PP-12-CON	202536	N.R.

I = Result between detection limit and practical quantitation limit  
BUYER V WIDGREN

NOTE: N. R. = ANALYSIS NOT REQUIRED

PROJECT MANAGER

*Paul Bertram*



## REPORT OF ANALYSES

CH2M HILL  
800 FAIRWAY DRIVE  
SUITE 350  
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DATE: 03/28/01  
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DEP CQAP # 870017G  
YOUR REF/P.O.: 148010

SAMPLES RECEIVED 2/16/01 (Page 5 of 14)

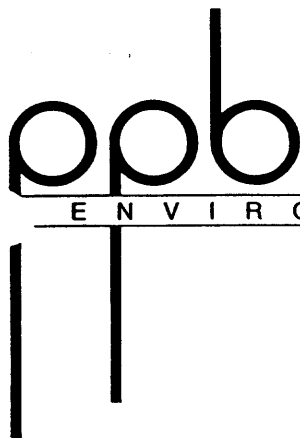
CLIENT STATION ID	LAB NUMBER	%SOLIDS %	WET WEIGHT g	DRY WEIGHT g	AFDW mg/L	BLK DNSTY G/CC	CA/T/ICP mg/L
PP-14-CON	202537	N.R.	9.9840	0.0878 I	7870	N.R.	1530
PP-17-CON	202538	N.R.	10.2725	0.5228	8260	N.R.	1500
PP-19-CON	202539	N.R.	10.044	0.3930 I	21400	N.R.	7100
PP-20-CON	202540	N.R.	9.929	0.0685 I	3080	N.R.	1180
PP-21-CON	202541	N.R.	11.266 Q	1.7609 Q	20000	N.R.	11500
PP-22-CON	202542	N.R.	10.707 Q	1.3498 Q	32100	N.R.	16500
PP-FD1-CON	202543	N.R.	10.455	0.8584	50800	N.R.	1240
PP-3-UPR1	202544	69.6	N.R.	N.R.	N.R.	1.18	N.R.
PP-3-UPR2	202545	71.2	N.R.	N.R.	N.R.	1.50	N.R.
PP-5-UPR1	202546	74.7	N.R.	N.R.	N.R.	1.36	N.R.
PP-5-UPR2	202547	72.2	N.R.	N.R.	N.R.	1.30	N.R.
PP-10-UPR1	202548	63.3	N.R.	N.R.	N.R.	1.44	N.R.
PP-10-UPR2	202549	62.0	N.R.	N.R.	N.R.	1.48	N.R.
PP-12-UPR1	202550	27.6	N.R.	N.R.	N.R.	0.38 I	N.R.
PP-12-UPR2	202551	21.6	N.R.	N.R.	N.R.	0.28 I	N.R.
PP-14-UPR1	202552	23.4	N.R.	N.R.	N.R.	0.33 I	N.R.
PP-14-UPR2	202553	38.2	N.R.	N.R.	N.R.	0.33 I	N.R.
PP-17-UPR1	202554	36.4	N.R.	N.R.	N.R.	0.30 I	N.R.
PP-17-UPR2	202555	22.7	N.R.	N.R.	N.R.	0.29 I	N.R.
PP-19-UPR1	202556	73.9	N.R.	N.R.	N.R.	1.32	N.R.
PP-19-UPR2	202557	73.0	N.R.	N.R.	N.R.	1.34	N.R.
PP-20-UPR1	202558	83.4	N.R.	N.R.	N.R.	1.39	N.R.
PP-20-UPR2	202559	83.0	N.R.	N.R.	N.R.	1.28	N.R.
PP-FD1-UPR	202560	73.8	N.R.	N.R.	N.R.	1.36	N.R.

I = Result between detection limit and practical quantitation limit

Q = Result analyzed out of holding time

BUYER V WIDGREN

NOTE: N. R. = ANALYSIS NOT REQUIRED



## REPORT OF ANALYSES

CH2M HILL  
800 FAIRWAY DRIVE  
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SAMPLES RECEIVED 2/16/01 (Page 6 of 14)

CLIENT STATION ID	LAB NUMBER	CA/S/ICP mg/kg
PP-14-CON	202537	N.R.
PP-17-CON	202538	N.R.
PP-19-CON	202539	N.R.
PP-20-CON	202540	N.R.
PP-21-CON	202541	N.R.
PP-22-CON	202542	N.R.
PP-FD1-CON	202543	N.R.
PP-3-UPR1	202544	126000
PP-3-UPR2	202545	163000
PP-5-UPR1	202546	174000
PP-5-UPR2	202547	130000
PP-10-UPR1	202548	142000
PP-10-UPR2	202549	128000
PP-12-UPR1	202550	8790
PP-12-UPR2	202551	131000
PP-14-UPR1	202552	20200
PP-14-UPR2	202553	295000
PP-17-UPR1	202554	258000
PP-17-UPR2	202555	69800
PP-19-UPR1	202556	5790
PP-19-UPR2	202557	5400
PP-20-UPR1	202558	569
PP-20-UPR2	202559	678
PP-FD1-UPR	202560	5420

I = Result between detection limit and practical quantitation limit  
BUYER V WIDGREN

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PROJECT MANAGER





## REPORT OF ANALYSES

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SAMPLES RECEIVED 2/16/01 (Page 7 of 14)

CLIENT STATION ID	LAB NUMBER	%SOLIDS %	WET WEIGHT g	DRY WEIGHT g	AFDW mg/L	BLK DNSTY G/CC	CA/T/ICP mg/L
PP-FD2-UPR	202561	71.7	N.R.	N.R.	N.R.	1.18	N.R.
PP-EB1-UPR	202562	N.R.	N.R.	N.R.	N.R.	N.R.	0.04 I
PP-EB2-UPR	202563	N.R.	N.R.	N.R.	N.R.	N.R.	0.02 I
PP-19-FP1	202564	N.R.	N.R.	N.R.	7110	N.R.	7550
PP-19-FP2	202565	N.R.	N.R.	N.R.	10700	N.R.	6010
PP-20-FP1	202566	N.R.	N.R.	N.R.	11400	N.R.	9460
PP-20-FP2	202567	N.R.	N.R.	N.R.	11600	N.R.	8900
PP-21-FP1	202568	N.R.	N.R.	N.R.	10300	N.R.	8990
PP-21-FP2	202569	N.R.	N.R.	N.R.	11400	N.R.	10600
PP-22-FP1	202570	N.R.	N.R.	N.R.	10300	N.R.	8700
PP-22-FP2	202571	N.R.	N.R.	N.R.	10200	N.R.	8810
PP-FD1-FP	202572	N.R.	N.R.	N.R.	7120	N.R.	5810
PP-FD2-FP	202573	N.R.	N.R.	N.R.	7470	N.R.	6440
PP-20-WP1	202574	N.R.	N.R.	N.R.	2290	N.R.	1260
PP-21-WP1	202575	N.R.	N.R.	N.R.	9600	N.R.	8760
PP-21-WP2	202576	N.R.	N.R.	N.R.	9840	N.R.	9340
PP-22-WP1	202577	N.R.	N.R.	N.R.	4320	N.R.	4160
PP-22-WP2	202578	N.R.	N.R.	N.R.	7950	N.R.	7660
PP-FD2-WP	202579	N.R.	N.R.	N.R.	4360	N.R.	4320
PP-20-BP1	202580	N.R.	N.R.	N.R.	7570	N.R.	4530
PP-20-BP2	202581	N.R.	N.R.	N.R.	8760	N.R.	5240
PP-21-BP1	202582	N.R.	N.R.	N.R.	11000	N.R.	9080
PP-21-BP2	202583	N.R.	N.R.	N.R.	8440	N.R.	8540
PP-22-BP1	202584	N.R.	N.R.	N.R.	8350	N.R.	9340

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BUYER V WIDGREN

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PROJECT MANAGER



## REPORT OF ANALYSES

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SAMPLES RECEIVED 2/16/01 (Page 8 of 14)

CLIENT STATION ID	LAB NUMBER	CA/S/ICP mg/kg
PP-FD2-UPR	202561	243000
PP-EB1-UPR	202562	N.R.
PP-EB2-UPR	202563	N.R.
PP-19-FP1	202564	N.R.
PP-19-FP2	202565	N.R.
PP-20-FP1	202566	N.R.
PP-20-FP2	202567	N.R.
PP-21-FP1	202568	N.R.
PP-21-FP2	202569	N.R.
PP-22-FP1	202570	N.R.
PP-22-FP2	202571	N.R.
PP-FD1-FP	202572	N.R.
PP-FD2-FP	202573	N.R.
PP-20-WP1	202574	N.R.
PP-21-WP1	202575	N.R.
PP-21-WP2	202576	N.R.
PP-22-WP1	202577	N.R.
PP-22-WP2	202578	N.R.
PP-FD2-WP	202579	N.R.
PP-20-BP1	202580	N.R.
PP-20-BP2	202581	N.R.
PP-21-BP1	202582	N.R.
PP-21-BP2	202583	N.R.
PP-22-BP1	202584	N.R.

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BUYER V WIDGREN

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## REPORT OF ANALYSES

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SAMPLES RECEIVED 2/16/01 (Page 9 of 14)

CLIENT STATION ID	LAB NUMBER	%SOLIDS %	WET WEIGHT g	DRY WEIGHT g	AFDW mg/L	BLK DNSTY G/CC	CA/T/ICP mg/L
PP-22-BP2	202585	N.R.	N.R.	N.R.	8250	N.R.	8170
PP-FD1-BP	202586	N.R.	N.R.	N.R.	8950	N.R.	4600
PP-3-LRW1	202587	85.4	N.R.	N.R.	N.R.	1.40	N.R.
PP-3-LRW2	202588	82.7	N.R.	N.R.	N.R.	1.43	N.R.
PP-5-LRW1	202589	82.6	N.R.	N.R.	N.R.	1.57	N.R.
PP-5-LRW2	202590	79.5	N.R.	N.R.	N.R.	1.60	N.R.
PP-10-LRW1	202591	76.3	N.R.	N.R.	N.R.	1.26	N.R.
PP-10-LRW2	202592	67.5	N.R.	N.R.	N.R.	1.42	N.R.
PP-12-LRW1	202593	26.6	N.R.	N.R.	N.R.	0.42	N.R.
PP-12-LRW2	202594	27.0	N.R.	N.R.	N.R.	0.41	N.R.
PP-14-LRW1	202595	27.9	N.R.	N.R.	N.R.	0.41	N.R.
PP-14-LRW2	202596	22.6	N.R.	N.R.	N.R.	0.41	N.R.
PP-17-LRW1	202597	28.0	N.R.	N.R.	N.R.	0.41	N.R.
PP-17-LRW2	202598	37.2	N.R.	N.R.	N.R.	0.40 I	N.R.
PP-19-LRW1	202599	81.0	N.R.	N.R.	N.R.	1.48	N.R.
PP-19-LRW2	202600	80.8	N.R.	N.R.	N.R.	1.53	N.R.
PP-20-LRW1	202601	79.5	N.R.	N.R.	N.R.	1.59	N.R.
PP-20-LRW2	202602	80.9	N.R.	N.R.	N.R.	1.57	N.R.
PP-FD1-LWR1	202603	81.0	N.R.	N.R.	N.R.	1.60	N.R.
PP-FD2-LWR	202604	81.6	N.R.	N.R.	N.R.	1.36	N.R.
PP-FD2-BP	202606	N.R.	N.R.	N.R.	7790	N.R.	5550
PP-FD3-LWR	202607	68.3	N.R.	N.R.	N.R.	1.30	N.R.
PP-EB1-LWR	202608	N.R.	N.R.	N.R.	N.R.	N.R.	0.02 I
PP-EB2-LWR	202609	N.R.	N.R.	N.R.	N.R.	N.R.	0.20

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## REPORT OF ANALYSES

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SAMPLES RECEIVED 2/16/01 (Page 10 of 14)

CLIENT STATION ID	LAB NUMBER	CA/S/ICP mg/kg
PP-22-BP2	202585	N.R.
PP-FD1-BP	202586	N.R.
PP-3-LRW1	202587	144000
PP-3-LRW2	202588	153000
PP-5-LRW1	202589	193000
PP-5-LRW2	202590	164000
PP-10-LRW1	202591	162000
PP-10-LRW2	202592	167000
PP-12-LRW1	202593	111000
PP-12-LRW2	202594	124000
PP-14-LRW1	202595	94700
PP-14-LRW2	202596	90700
PP-17-LRW1	202597	174000
PP-17-LRW2	202598	93200
PP-19-LRW1	202599	630
PP-19-LRW2	202600	563
PP-20-LRW1	202601	508
PP-20-LRW2	202602	1180
PP-FD1-LWR1	202603	1060
PP-FD2-LWR	202604	168000
PP-FD2-BP	202606	N.R.
PP-FD3-LWR	202607	206000
PP-EB1-LWR	202608	N.R.
PP-EB2-LWR	202609	N.R.

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SAMPLES RECEIVED 2/16/01 (Page 11 of 14)

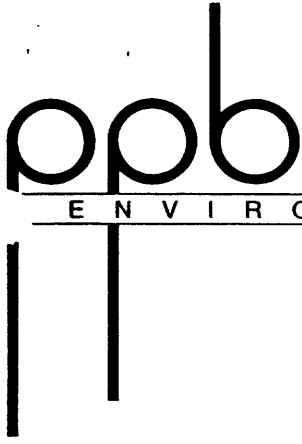
CLIENT STATION ID	LAB NUMBER	%SOLIDS %	WET WEIGHT g	DRY WEIGHT g	AFDW mg/g	BLK DNSTY G/CC	CA/T/ICP mg/L
PP-3-MAC1	202619	N.R.	75.950	10.389	843 Q	N.R.	N.R.
PP-3-MAC2	202620	N.R.	85.250	11.020	844 Q	N.R.	N.R.
PP-5-MAC1	202621	N.R.	96.425	16.262	856 Q	N.R.	N.R.
PP-5-MAC2	202622	N.R.	84.589	19.801	885 Q	N.R.	N.R.
PP-10-MAC1	202623	N.R.	94.796	17.223	887 Q	N.R.	N.R.
PP-10-MAC2	202624	N.R.	65.281	13.386	868 Q	N.R.	N.R.
PP-12-MAC1	202625	N.R.	83.726	21.159	899 Q	N.R.	N.R.
PP-12-MAC2	202626	N.R.	102.311	24.654	888 Q	N.R.	N.R.
PP-14-MAC1	202627	N.R.	120.243	14.388	906 Q	N.R.	N.R.
PP-14-MAC2	202628	N.R.	176.419	20.109	898 Q	N.R.	N.R.
PP-17-MAC1	202629	N.R.	130.318	16.390	879 Q	N.R.	N.R.
PP-17-MAC2	202630	N.R.	97.862	15.893	897 Q	N.R.	N.R.
PP-19-MAC1	202631	N.R.	103.717	20.882	883 Q	N.R.	N.R.
PP-19-MAC2	202632	N.R.	107.342	23.175	881 Q	N.R.	N.R.
PP-20-MAC1	202633	N.R.	67.501	15.542	727 Q	N.R.	N.R.
PP-20-MAC2	202634	N.R.	43.066	11.125	883 Q	N.R.	N.R.
PP-FD1-MAC	202635	N.R.	113.593	20.262	794 Q	N.R.	N.R.
PP-FD2-MAC	202636	N.R.	67.827	10.403	867 Q	N.R.	N.R.
PP-3-RTS1	202637	N.R.	106.322	20.008	353 Q	N.R.	N.R.
PP-3-RTS2	202638	N.R.	107.783	13.503	490 Q	N.R.	N.R.
PP-5-RTS1	202639	N.R.	123.976	17.362	628 Q	N.R.	N.R.
PP-5-RTS2	202640	N.R.	79.989	12.223	783 Q	N.R.	N.R.
PP-10-RTS1	202641	N.R.	10.958	13.462	746 Q	N.R.	N.R.
PP-10-RTS2	202642	N.R.	209.471	27.128	861 Q	N.R.	N.R.

I = Result between detection limit and practical quantitation limit

Q = Result analyzed out of holding time

BUYER V WIDGREN

NOTE: N. R. = ANALYSIS NOT REQUIRED



## REPORT OF ANALYSES

CH2M HILL  
800 FAIRWAY DRIVE  
SUITE 350  
DEERFIELD BEACH, FL 33441-  
Attn: MS ELLEN PATTERSON

DATE: 03/28/01  
FDH # E82001  
DEP CQAP # 870017G  
YOUR REF/P.O.: 148010

SAMPLES RECEIVED 2/16/01 (Page 12 of 14)

CLIENT STATION ID	LAB NUMBER	CA/S/ICP mg/kg
PP-3-MAC1	202619	26400
PP-3-MAC2	202620	17700
PP-5-MAC1	202621	23500
PP-5-MAC2	202622	7040
PP-10-MAC1	202623	11900
PP-10-MAC2	202624	16600
PP-12-MAC1	202625	5550
PP-12-MAC2	202626	5500
PP-14-MAC1	202627	5140
PP-14-MAC2	202628	5600
PP-17-MAC1	202629	11500
PP-17-MAC2	202630	7090
PP-19-MAC1	202631	4520
PP-19-MAC2	202632	6330
PP-20-MAC1	202633	15000
PP-20-MAC2	202634	7050
PP-FD1-MAC	202635	17200
PP-FD2-MAC	202636	15100
PP-3-RTS1	202637	84200
PP-3-RTS2	202638	138000
PP-5-RTS1	202639	67300
PP-5-RTS2	202640	26700
PP-10-RTS1	202641	31200
PP-10-RTS2	202642	14400

I = Result between detection limit and practical quantitation limit  
BUYER V WIDGREN

NOTE: N. R. = ANALYSIS NOT REQUIRED

PROJECT MANAGER



## REPORT OF ANALYSES

CH2M HILL  
800 FAIRWAY DRIVE  
SUITE 350  
DEERFIELD BEACH, FL 33441-  
Attn: MS ELLEN PATTERSON

DATE: 03/28/01  
FDH # E82001  
DEP CQAP # 870017G  
YOUR REF/P.O.: 148010

SAMPLES RECEIVED 2/16/01 (Page 13 of 14)

CLIENT STATION ID	LAB NUMBER	%SOLIDS %	WET WEIGHT g	DRY WEIGHT g	AFDW mg/g	BLK DNSTY G/CC	CA/T/ICP mg/L
PP-12-RTS1	202643	N.R.	87.322	13.318	902 Q	N.R.	N.R.
PP-12-RTS2	202644	N.R.	125.985	17.832	917 Q	N.R.	N.R.
PP-14-RTS1	202645	N.R.	137.003	15.580	855 Q	N.R.	N.R.
PP-14-RTS2	202646	N.R.	144.146	13.846	899 Q	N.R.	N.R.
PP-17-RTS1	202647	N.R.	91.801	10.833	883 Q	N.R.	N.R.
PP-17-RTS2	202648	N.R.	86.706	9.428	864 Q	N.R.	N.R.
PP-19-RTS1	202649	N.R.	121.826	15.119	870 Q	N.R.	N.R.
PP-19-RTS2	202650	N.R.	126.976	14.774	886 Q	N.R.	N.R.
PP-20-RTS1	202651	N.R.	97.403	14.918	855 Q	N.R.	N.R.
PP-20-RTS2	202652	N.R.	130.904	19.373	792 Q	N.R.	N.R.
PP-FD1-RTS	202653	N.R.	136.734	19.069	866 Q	N.R.	N.R.
PP-FD2-RTS	202654	N.R.	118.075	27.311	261 Q	N.R.	N.R.

I = Result between detection limit and practical quantitation limit  
Q = Result analyzed out of holding time  
BUYER V WIDGREN

NOTE: N. R. = ANALYSIS NOT REQUIRED

PROJECT MANAGER



## REPORT OF ANALYSES

CH2M HILL  
800 FAIRWAY DRIVE  
SUITE 350  
DEERFIELD BEACH, FL 33441-  
Attn: MS ELLEN PATTERSON

DATE: 03/28/01  
FDH # E82001  
DEP CQAP # 870017G  
YOUR REF/P.O.: 148010

SAMPLES RECEIVED 2/16/01 (Page 14 of 14)

CLIENT STATION ID	LAB NUMBER	CA/S/ICP mg/kg
PP-12-RTS1	202643	4460
PP-12-RTS2	202644	4830
PP-14-RTS1	202645	12600
PP-14-RTS2	202646	10100
PP-17-RTS1	202647	4340
PP-17-RTS2	202648	8360
PP-19-RTS1	202649	5440
PP-19-RTS2	202650	5760
PP-20-RTS1	202651	8220
PP-20-RTS2	202652	6900
PP-FD1-RTS	202653	17800
PP-FD2-RTS	202654	127000

I = Result between detection limit and practical quantitation limit  
BUYER V WIDGREN

NOTE: N. R. = ANALYSIS NOT REQUIRED

PROJECT MANAGER





QC REPORT FOR CH2M HILL 03/28/01      PAGE 1

TOTAL SOLIDS      %      SO      Method: EPA 160.3      Alt. Method: None

## Duplicates

PPB Number	Client ID	Value 1	Value 2	Range	% RSD	QC Control Limit
202552	PP-14-UPR1	23.0	23.7	0.70	2.12	10.99
202587	PP-3-LRW1	82.8	87.9	5.1	4.23	3.90
202597	PP-17-LRW1	28.7	27.3	1.4	3.54	11.01
202607	PP-FD3-LWR	63.7	72.9	9.2	9.52	11.04

NO SPIKE QC DATA FOUND

NO REFERENCE QC DATA FOUND

TOTAL WET WEIGHT      g      WA      Method: SM 2540B      Alt. Method: None

NO DUPLICATE QC DATA FOUND

NO SPIKE QC DATA FOUND

NO REFERENCE QC DATA FOUND

TOTAL WET WEIGHT      g      VG      Method: SM 2540B      Alt. Method: None

NO DUPLICATE QC DATA FOUND

NO SPIKE QC DATA FOUND

NO REFERENCE QC DATA FOUND



## QC REPORT FOR CH2M HILL 03/28/01 PAGE 2

TOTAL DRY WEIGHT g WA Method: SM 2540B Alt. Method: None

## Duplicates

PPB Number	Client ID	Value 1	Value 2	Range	% RSD	QC Control Limit
202533	PP-3-CON	0.2680	0.5188	0.25	45.08	NO DATA
202538	PP-17-CON	0.5895	0.4562	0.13	18.03	NO DATA

NO SPIKE QC DATA FOUND

NO REFERENCE QC DATA FOUND

TOTAL DRY WEIGHT g VG Method: SM 2540B Alt. Method: None

NO DUPLICATE QC DATA FOUND

NO SPIKE QC DATA FOUND

NO REFERENCE QC DATA FOUND

ASH FREE DRY WEIGHT mg/L WA Method: SM10300D Alt. Method: None

## Duplicates

PPB Number	Client ID	Value 1	Value 2	Range	% RSD	QC Control Limit
202498	PP-17-BP2	37500	38900	1400	2.59	42.45
202508	PP-10-FP2	8370	10600	2230	16.62	40.89
202518	PP-5-WP2	13000	13600	600	3.19	41.02
202529	PP-20-WP2	779	776	3.0	0.27	32.22
202542	PP-22-CON	32400	31800	600	1.32	36.63
202572	PP-FD1-FP	7080	7150	70	0.70	39.72
202581	PP-20-BP2	8610	8920	310	2.50	38.66
202585	PP-22-BP2	8180	8312	132	1.13	35.77

NO SPIKE QC DATA FOUND

NO REFERENCE QC DATA FOUND



QC REPORT FOR CH2M HILL 03/28/01      PAGE 3

## Blanks

Blank Concentration Analytical Batch # Sample Numbers in Batch

<12	46512	202489-202543, 202564-202586, 202606,
<12	46512	202489-202543, 202564-202586, 202606,
<12	46512	202489-202543, 202564-202586, 202606,

ASH FREE DRY WEIGHT

mg/L

VG

Method: SM10300D

Alt. Method: None

## Duplicates

PPB Number Client ID

Value 1 Value 2 Range % RSD QC Control Limit

202628	PP-14-MAC2	900	897	3.0	0.24	40.97
202638	PP-3-RTS2	526	454	72	10.39	36.57
202648	PP-17-RTS2	864	864	0	0.00	32.25
202652	PP-20-RTS2	856	729	127	11.33	30.33

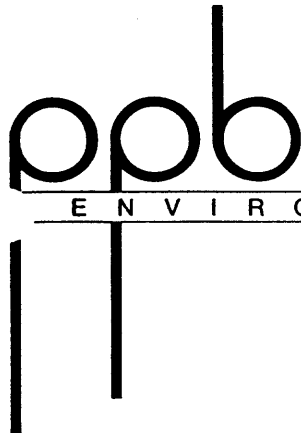
NO SPIKE QC DATA FOUND

NO REFERENCE QC DATA FOUND

## Blanks

Blank Concentration Analytical Batch # Sample Numbers in Batch

<12	46703	202619-202654,
<12	46703	202619-202654,



QC REPORT FOR CH2M HILL 03/28/01      PAGE 4

BULK DRY DENSITY      G/CC      SO      Method: BULK DNSTY Alt. Method: None

NO DUPLICATE QC DATA FOUND

NO SPIKE QC DATA FOUND

NO REFERENCE QC DATA FOUND

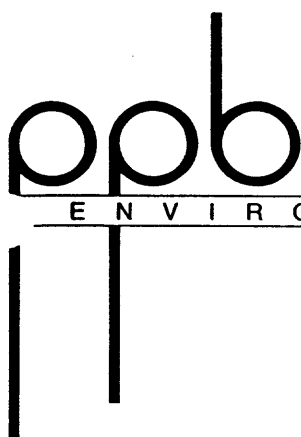
CALCIUM, TOTAL      mg/L      WA      Method: EPA 200.7      Alt. Method: EPA 6010

## Duplicates

PPB Number	Client ID	Value 1	Value 2	Range	% RSD	QC Control Limit
202489	PP-3-BP1	14300	14100	200	1.00	7.80
202499	PP-19-BP1	8370	8150	220	1.88	7.82
202519	PP-10-WP1	16600	15700	900	3.94	7.72
202529	PP-20-WP2	428	416	12	2.01	7.80
202539	PP-19-CON	7530	6670	860	8.56	7.13
202567	PP-20-FP2	9110	8680	430	3.42	7.97
202576	PP-21-WP2	9310	9380	70	0.53	7.65
202586	PP-FD1-BP	4590	4600	10	0.15	7.54
202608	PP-EB1-LWR	0.03	<0.02	0.020	70.71	NO DATA

## Spikes

PPB Number	Client ID	% MS	% MSD	Spike Recovery Control Limits	% RSD	% RSD Control Limit
202490	PP-3-BP2	99	---	65 TO 128	----	----
202500	PP-19-BP2	106	---	66 TO 128	----	----
202510	PP-14-FP2	108	---	68 TO 128	----	----
202520	PP-10-WP2	103	---	68 TO 128	----	----
202530	PP-FD1-WP2	91	---	65 TO 127	----	----
202530	PP-FD1-WP2	108	---	65 TO 127	----	----
202540	PP-20-CON	105	---	68 TO 127	----	----
202564	PP-19-FP1	107	---	68 TO 127	----	----
202569	PP-21-FP2	107	---	68 TO 127	----	----
202578	PP-22-WP2	111	---	69 TO 126	----	----



QC REPORT FOR CH2M HILL 03/28/01    PAGE 5

**Spikes**

PPB Number	Client ID	Spike Recovery		% RSD	
		% MS	% MSD Control Limits	% RSD Control Limits	% RSD Control Limit
202582	PP-21-BP1	101	68 TO 127	----	----
202609	PP-EB2-LWR	106	65 TO 128	----	----
202609	PP-EB2-LWR	105	65 TO 128	----	----

**References**

Reference ID	Target	Found	% Recovery	Control Limits
ICV	20.0	20.7	104	91 TO 114
PPBMULTI	20.0	21.1	106	91 TO 114
ICV	20.0	21.1	106	92 TO 114
CS1-7333	2.00	2.18	109	92 TO 114
ICV	20.0	20.2	101	91 TO 114
HP	10.0	10.7	107	91 TO 114
HIGH PURITY	20.0	20.1	100	92 TO 115

**Blanks**

Blank Concentration    Analytical Batch #    Sample Numbers in Batch

<0.02	46585	202489-202510, 202512-202528, 202531-202533, 202535-202542, 202562-202586, 202606, 202608-202609,
0.03	46585	202489-202510, 202512-202528, 202531-202533, 202535-202542, 202562-202586, 202606, 202608-202609,

CALCIUM IN SEDIMENT                      mg/kg                      SO    Method: EPA 6010    Alt. Method: None

**Duplicates**

PPB Number	Client ID	Value 1	Value 2	Range	% RSD	QC Control Limit
202547	PP-5-UPR2	143000	118000	25000	13.55	12.35
202557	PP-19-UPR2	5730	5070	660	8.64	NO DATA
202587	PP-3-LRW1	126000	162000	36000	17.68	19.50
202589	PP-5-LRW1	193000	193000	0	0.00	42.53



QC REPORT FOR CH2M HILL 03/28/01 PAGE 6

## Duplicates

PPB Number	Client ID	Value 1	Value 2	Range	% RSD	QC Control Limit
202597	PP-17-LRW1	213000	133000	80000	32.70	26.03
202597	PP-17-LRW1	214000	135000	79000	32.01	41.07

## Spikes

PPB Number	Client ID	% MS	% MSD	Spike Recovery Control Limits	% RSD	RSD Control Limit
202548	PP-10-UPR1	124	---	77 TO 131	----	----
202550	PP-12-UPR1	97	---	71 TO 146	----	----
202558	PP-20-UPR1	96	---	9 TO 220	----	----
202590	PP-5-LRW2	86	---	72 TO 139	----	----
202594	PP-12-LRW2	101	---	70 TO 143	----	----
202598	PP-17-LRW2	197	---	65 TO 140	----	----

## References

Reference ID	Target	Found	% Recovery	Control Limits
PP222	2970	3594	121	85 TO 129
ICV	20.0	20.6	103	83 TO 135

## Blanks

Blank Concentration Analytical Batch # Sample Numbers in Batch

<0.02	46885	202589-202604, 202607,
-------	-------	------------------------

CALCIUM IN SEDIMENT mg/kg VG Method: EPA 6010 Alt. Method: None

## Duplicates

PPB Number	Client ID	Value 1	Value 2	Range	% RSD	QC Control Limit
202619	PP-3-MAC1	26000	26700	700	1.88	NO DATA
202629	PP-17-MAC1	13900	9060	4840	29.81	47.26
202639	PP-5-RTS1	72500	62200	10300	10.81	53.49
202649	PP-19-RTS1	5650	5240	410	5.32	13.42



QC REPORT FOR CH2M HILL 03/28/01      PAGE 7

**Spikes**

PPB Number	Client ID	% MS	% MSD	Spike Recovery		% RSD
				Control Limits	% RSD Control Limit	
202620	PP-3-MAC2	87	---	39 TO 140	----	----
202630	PP-17-MAC2	92	---	41 TO 138	----	----
202640	PP-5-RTS2	95	---	43 TO 136	----	----
202650	PP-19-RTS2	98	---	45 TO 135	----	----

**References**

Reference ID	Target	Found	% Recovery	Control Limits
ICV	20.0	18.1	90	89 TO 119
LCS1-7349	65.9	58.8	89	81 TO 123

**Blanks**

Blank Concentration	Analytical Batch #	Sample Numbers in Batch
<0.02	46913	202619-202654,
2.34	46913	202619-202654,
1.02	46913	202619-202654,



E N V I R O N M E N T A L   L A B O R A T O R I E S .   I N C .

DATE, TIME, ANALYST REPORT

ANALYSIS	METHOD	PREP		ANALYSIS			
		DATE	BY	DATE	TIME	BY	MATRIX
%SOLIDS	EPA 160.3	/	/	02/19/01	1030	CB	SO
AFDW		/	/	03/14/01	1300	CB	VG
AFDW		/	/	02/19/01	1043	FKE	WA
BLK DNSTY		/	/	02/20/01		LAW	SO
CA/S/ICP	EPA 6010	02/26/01	ECS	03/13/01	0700	CEP	SO
CA/S/ICP	EPA 6010	02/26/01	ECS	03/16/01	1539	SEK	SO
CA/S/ICP	EPA 6010	02/26/01	ECS	03/21/01	0700	CEP	SO
CA/S/ICP	EPA 6010	03/09/01	SEK	03/18/01	1000	CAH	VG
CA/T/ICP	EPA 200.7	02/19/01	SEK	02/20/01	0830	SEK	WA
CA/T/ICP	EPA 200.7	02/19/01	SEK	02/22/01	1030	SEK	WA
CA/T/ICP	EPA 200.7	02/19/01	SEK	03/09/01	1200	CAH	WA
CA/T/ICP	EPA 200.7	02/27/01	BFC	03/21/01	0700	CEP	WA
DRY WEIGHT	SM 2540B	/	/	02/20/01	1000	CAB	VG
DRY WEIGHT	SM 2540B	/	/	02/20/01	2000	CAB	WA
WET WEIGHT	SM 2540B	/	/	02/20/01	1000	CAB	VG
WET WEIGHT	SM 2540B	/	/	02/21/01	2000	CAB	WA



# IFAS Lab Reports

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			WBL ANALYTICAL REPORT 2001-02					
			Project: PSTA Water samples					
			Sampling: February 2001					
			3/20/01					
Log in Date	Sampling Date	Field No.	Field ID	Type	Analysis	Lab #	SRP mg/L	TP/TDP mg/L
2/7/01	2/6/01	P2-1200	TC-HC-W	W	TP	1501		0.023
		P2-1201	TC-3OUT-W	W	TP	1502		0.024
		P2-1202	TC-8OUT-W	W	TP	1503		0.013
		P2-1203	TC-13OUT-W	W	TP	1504		0.025
		P2-1204	TC-FD1-W	W	TP	1505		0.025
2/7/01	2/6/01	P2-1205	TC-HC-W	W	TDP	1506		0.013
		P2-1206	TC-3OUT-W	W	TDP	1507		0.012
		P2-1207	TC-8OUT-W	W	TDP	1508		0.007
		P2-1208	TC-13OUT-W	W	TDP	1509		0.015
2/7/01	2/6/01	P2-1209	TC-FD1-W	W	TDP	1510		0.016
2/9/01	2/8/01	P2-1633	FS-EB1	W	TP	1524		0.001
2/9/01	2/8/01	P2-1647	FS-EB1	W	TP	1538		0.001
2/13/01	2/12/01	P2-0793	PP-1OUT-W	W	TP	1543		0.013
		P2-0794	PP-2OUT-W	W	TP	1544		0.016
		P2-0795	PP-3OUT-W	W	TP	1545		0.010
		P2-0796	PP-4OUT-W	W	TP	1546		0.008
		P2-0797	PP-5OUT-W	W	TP	1547		0.013
		P2-0798	PP-6OUT-W	W	TP	1548		0.014
		P2-0799	PP-7OUT-W	W	TP	1549		0.011
		P2-0800	PP-8OUT-W	W	TP	1550		0.013
		P2-0801	PP-9OUT-W	W	TP	1551		0.009
		P2-0802	PP-10OUT-W	W	TP	1552		0.010
		P2-0803	PP-11OUT-W	W	TP	1553		0.015
		P2-0804	PP-12OUT-W	W	TP	1554		0.037
		P2-0805	PP-13OUT-W	W	TP	1555		0.009
		P2-0806	PP-14OUT-W	W	TP	1556		0.013
		P2-0807	PP-15OUT-W	W	TP	1557		0.017
		P2-0808	PP-16OUT-W	W	TP	1558		0.025
		P2-0809	PP-17OUT-W	W	TP	1559		0.012
		P2-0810	PP-18OUT-W	W	TP	1560		0.012
		P2-0811	PP-19OUT-W	W	TP	1561		0.011
		P2-0812	PP-20OUT-W	W	TP	1562		0.021
		P2-0813	PP-21OUT-W	W	TP	1563		0.011
		P2-0814	PP-22OUT-W	W	TP	1564		0.011
		P2-0815	PP-23OUT-W	W	TP	1565		0.017
		P2-0816	PP-24OUT-W	W	TP	1566		0.017
		P2-0817	PP-HT1-W	W	TP	1567		0.019
		P2-0818	PP-HT2-W	W	TP	1568		0.019
		P2-0819	PP-HT3-W	W	TP	1569		0.021
		P2-0820	PP-FD1-W	W	TP	1570		0.011
		P2-0821	PP-FD2-W	W	TP	1571		0.013
		P2-0822	PP-FD3-W	W	TP	1572		0.018
		P2-0823	PP-EB1-W	W	TP	1573		0.003

			WBL ANALYTICAL REPORT 2001-02					
			Project: PSTA Water samples					
			Sampling: February 2001					
			3/20/01					
Log in	Sampling	Field No.	Field ID	Type	Analysis	Lab #	SRP	TP/TDP
Date	Date						mg/L	mg/L
2/13/01	2/12/01	P2-0824	PP-1OUT-W	W	TDP	1574		0.008
		P2-0825	PP-2OUT-W	W	TDP	1575		0.008
		P2-0826	PP-3OUT-W	W	TDP	1576		0.007
		P2-0827	PP-4OUT-W	W	TDP	1577		0.007
		P2-0828	PP-5OUT-W	W	TDP	1578		0.008
		P2-0829	PP-6OUT-W	W	TDP	1579		0.008
		P2-0830	PP-7OUT-W	W	TDP	1580		0.006
		P2-0831	PP-8OUT-W	W	TDP	1581		0.007
		P2-0832	PP-9OUT-W	W	TDP	1582		0.006
		P2-0833	PP-10OUT-W	W	TDP	1583		0.006
		P2-0834	PP-11OUT-W	W	TDP	1584		0.008
		P2-0835	PP-12OUT-W	W	TDP	1585		0.009
		P2-0836	PP-13OUT-W	W	TDP	1586		0.006
		P2-0837	PP-14OUT-W	W	TDP	1587		0.006
		P2-0838	PP-15OUT-W	W	TDP	1588		0.008
		P2-0839	PP-16OUT-W	W	TDP	1589		0.010
		P2-0840	PP-17OUT-W	W	TDP	1590		0.008
		P2-0841	PP-18OUT-W	W	TDP	1591		0.007
		P2-0842	PP-19OUT-W	W	TDP	1592		0.007
		P2-0843	PP-20OUT-W	W	TDP	1593		0.014
		P2-0844	PP-21OUT-W	W	TDP	1594		0.009
		P2-0845	PP-22OUT-W	W	TDP	1595		0.007
		P2-0846	PP-23OUT-W	W	TDP	1596		0.007
		P2-0847	PP-24OUT-W	W	TDP	1597		0.007
		P2-0848	PP-HT1-W	W	TDP	1598		0.009
		P2-0849	PP-HT2-W	W	TDP	1599		0.008
		P2-0850	PP-HT3-W	W	TDP	1600		0.011
		P2-0851	PP-FD1-W	W	TDP	1601		0.007
		P2-0852	PP-FD2-W	W	TDP	1602		0.006
		P2-0853	PP-FD3-W	W	TDP	1603		0.007
		P2-0854	PP-EB1-W	W	TDP	1604		0.002
2/13/01	2/12/01	P2-0855	PP-1OUT-W	W	SRP	1605	0.002	
		P2-0856	PP-2OUT-W	W	SRP	1606	0.002	
		P2-0857	PP-3OUT-W	W	SRP	1607	0.003	
		P2-0858	PP-4OUT-W	W	SRP	1608	0.003	
		P2-0859	PP-5OUT-W	W	SRP	1609	0.003	
		P2-0860	PP-6OUT-W	W	SRP	1610	0.001	
		P2-0861	PP-7OUT-W	W	SRP	1611	0.003	
		P2-0862	PP-8OUT-W	W	SRP	1612	0.002	
		P2-0863	PP-9OUT-W	W	SRP	1613	0.001	
		P2-0864	PP-10OUT-W	W	SRP	1614	0.002	
		P2-0865	PP-11OUT-W	W	SRP	1615	0.003	
		P2-0866	PP-12OUT-W	W	SRP	1616	0.001	
		P2-0867	PP-13OUT-W	W	SRP	1617	0.002	

			WBL ANALYTICAL REPORT 2001-02					
			Project: PSTA Water samples					
			Sampling: February 2001					
			3/20/01					
Log in	Sampling	Field No.	Field ID	Type	Analysis	Lab #	SRP	TP/TDP
Date	Date						mg/L	mg/L
		P2-0868	PP-14OUT-W	W	SRP	1618	0.004	
		P2-0869	PP-15OUT-W	W	SRP	1619	0.002	
		P2-0870	PP-16OUT-W	W	SRP	1620	0.005	
		P2-0871	PP-17OUT-W	W	SRP	1621	0.004	
		P2-0872	PP-18OUT-W	W	SRP	1622	0.002	
		P2-0873	PP-19OUT-W	W	SRP	1623	0.001	
		P2-0874	PP-20OUT-W	W	SRP	1624	0.003	
		P2-0875	PP-21OUT-W	W	SRP	1625	0.003	
		P2-0876	PP-22OUT-W	W	SRP	1626	0.001	
		P2-0877	PP-23OUT-W	W	SRP	1627	0.001	
		P2-0878	PP-24OUT-W	W	SRP	1628	0.001	
		P2-0879	PP-HT1-W	W	SRP	1629	0.005	
		P2-0880	PP-HT2-W	W	SRP	1630	0.003	
		P2-0881	PP-HT3-W	W	SRP	1631	0.009	
		P2-0882	PP-FD1-W	W	SRP	1632	0.002	
		P2-0883	PP-FD2-W	W	SRP	1633	0.002	
		P2-0884	PP-FD3-W	W	SRP	1634	0.003	
		P2-0885	PP-EB1-W	W	SRP	1635	0.001	
2/14/01	2/13/01	P2-1235	TC-HC-W	W	TP	1636		0.022
		P2-1236	TC-3OUT-W	W	TP	1637		0.020
		P2-1237	TC-8OUT-W	W	TP	1638		0.014
		P2-1238	TC-13OUT-W	W	TP	1639		0.036
		P2-1239	TC-FD1-W	W	TP	1640		0.020
2/14/01	2/13/01	P2-1241	TC-HC-W	W	TDP	1641		0.013
		P2-1242	TC-3OUT-W	W	TDP	1642		0.011
		P2-1243	TC-8OUT-W	W	TDP	1643		0.006
		P2-1244	TC-13OUT-W	W	TDP	1644		0.019
		P2-1245	TC-FD1-W	W	TDP	1645		0.012
2/17/01		P2-1620	TC-3-8-23	W	TP	1646		0.035
		P2-1621	TC-3-9-23	W	TP	1647		0.033
		P2-1622	TC-3-10-23	W	TP	1648		0.020
		P2-1623	TC-3-11-23	W	TP	1649		0.037
		P2-1624	TC-3-12-23	W	TP	1650		0.038
		P2-1625	TC-3-13-23	W	TP	1651		0.039
		P2-1626	TC-3-14-23	W	TP	1652		0.074
		P2-1627	TC-3-15-23	W	TP	1653		0.026
		P2-1628	TC-3-13-out	W	TP	1654		0.029
		P2-1629	TC-3-3-out	W	TP	1655		0.010
		P2-1630	TC-3-1-out	W	TP	1656		0.019
		P2-1631	TC-3-9-out	W	TP	1657		0.061
		P2-1632	TC-3-3-out	W	TP	1658		0.019
		P2-1633	TC-3-11-out	W	TP	1659		0.028
		P2-1634	TC-3-2-out	W	TP	1660		0.010

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			Sampling: February 2001					
			3/20/01					
Log in Date	Sampling Date	Field No.	Field ID	Type	Analysis	Lab #	SRP mg/L	TP/TDP mg/L
		P2-1635	TC-3- -out	W	TP	1661		0.016
		P2-1636	TC-3-10-out	W	TP	1662		0.052
		P2-1637	TC-3-15-out	W	TP	1663		0.013
		P2-1638	TC-3-12-out	W	TP	1664		0.016
		P2-1639	TC-3-1-out	W	TP	1665		0.089
		P2-1640	TC-3-14-out	W	TP	1666		0.016
		P2-1641	TC-3- -out	W	TP	1667		0.024
		P2-1642	TC-3-2-out	W	TP	1668		0.079
		P2-1643	TC-3-6-out	W	TP	1669		0.059
		P2-1644	TC-3-8-out	W	TP	1670		0.032
		P2-1645	TC-3-5-out	W	TP	1671		0.061
		P2-1646	TC-3-4-out	W	TP	1672		0.064
		P2-1647	TC-3-7-out	W	TP	1673		0.034
		P2-1648	TC-3-3-out	W	TP	1674		0.072
2/14/01	2/13/01	P2-1241	TC-HC-W	W	TDP	1641		0.013
		P2-1242	TC-3OUT-W	W	TDP	1642		0.011
		P2-1243	TC-8OUT-W	W	TDP	1643		0.006
		P2-1244	TC-13OUT-W	W	TDP	1644		0.019
		P2-1245	TC-ED1-W	W	TDP	1645		0.012
2/17/01		P2-1620	TC-3-8-23	W	TP	1646		0.035
		P2-1621	TC-3-9-23	W	TP	1647		0.033
		P2-1622	TC-3-10-23	W	TP	1648		0.020
		P2-1623	TC-3-11-23	W	TP	1649		0.037
		P2-1624	TC-3-12-23	W	TP	1650		0.038
		P2-1625	TC-3-13-23	W	TP	1651		0.039
		P2-1626	TC-3-14-23	W	TP	1652		0.074
		P2-1627	TC-3-15-23	W	TP	1653		0.026
		P2-1628	TC-3-13-out	W	TP	1654		0.029
		P2-1629	TC-3-3-out	W	TP	1655		0.010
		P2-1630	TC-3-1-out	W	TP	1656		0.019
		P2-1631	TC-3-9-out	W	TP	1657		0.061
		P2-1632	TC-3-3-out	W	TP	1658		0.019
		P2-1633	TC-3-11-out	W	TP	1659		0.028
		P2-1634	TC-3-2-out	W	TP	1660		0.010
		P2-1635	TC-3- -out	W	TP	1661		0.016
		P2-1636	TC-3-10-out	W	TP	1662		0.052
		P2-1637	TC-3-15-out	W	TP	1663		0.013
		P2-1638	TC-3-12-out	W	TP	1664		0.016
		P2-1639	TC-3-1-out	W	TP	1665		0.089
		P2-1640	TC-3-14-out	W	TP	1666		0.016
		P2-1641	TC-3- -out	W	TP	1667		0.024
		P2-1642	TC-3-2-out	W	TP	1668		0.079
		P2-1643	TC-3-6-out	W	TP	1669		0.059
		P2-1644	TC-3-8-out	W	TP	1670		0.032

			WBL ANALYTICAL REPORT 2001-02					
			Project: PSTA Water samples					
			Sampling: February 2001					
			3/20/01					
Log in	Sampling	Field No.	Field ID	Type	Analysis	Lab #	SRP	TP/TDP
Date	Date						mg/L	mg/L
	?	P2-1645	TC-3-5-out	W	TP	1671		0.061
		P2-1646	TC-3-4-out	W	TP	1672		0.064
		P2-1647	TC-3-7-out	W	TP	1673		0.034
		P2-1648	TC-3-3-out	W	TP	1674		0.072
2/17/01	2/16/01	P2-0622	PP-EB1-FP	W	TP	1695		0.001
2/17/01	2/16/01	P2-0623	PP-EB2-FP	W	TP	1696		0.001
2/17/01	2/16/01	P2-0646	PP-EB1-WP	W	TP	1719		0.001
2/17/01	2/16/01	P2-0647	PP-EB2-WP	W	TP	1720		0.001
2/17/01	2/16/01	P2-0670	PP-EB1-BP	W	TP	1741		0.001
2/17/01	2/16/01	P2-0671	PP-EB2-BP	W	TP	1742		0.002
2/17/01	2/16/01	P2-0691	PP-EB1-UPR	w	TP	1761		0.000
		P2-0692	PP-EB2-UPR	w	TP	1762		0.000
2/17/01	2/16/01	P2-0712	PP-EB1-LWR	W	TP	1782		0.000
		P2-0713	PP-EB2-LWR	W	TP	1783		0.000
2/21/01	2/20/01	PP-1274	TC-HC-W	W	TP	1831		0.025
		PP-1275	TC-3IN-W	W	TP	1832		0.025
		PP-1276	TC-3OUT-W	W	TP	1833		0.021
		PP-1277	TC-8IN-W	W	TP	1834		0.022
		PP-1278	TC-8OUT-W	W	TP	1835		0.011
		PP-1279	TC-13IN-W	W	TP	1836		0.023
		PP-1280	TC-13OUT-W	W	TP	1837		0.030
		PP-1281	TC-FD1-W	W	TP	1838		0.021
		PP-1282	TC-EB1-W	W	TP	1839		0.002
2/21/01	2/20/01	PP-1283	TC-HC-W	W	TDP	1840		0.014
		PP-1284	TC-3IN-W	W	TDP	1841		0.016
		PP-1285	TC-3OUT-W	W	TDP	1842		0.013
		PP-1286	TC-8IN-W	W	TDP	1843		0.017
		PP-1287	TC-8OUT-W	W	TDP	1844		0.008
		PP-1288	TC-13IN-W	W	TDP	1845		0.019
		PP-1289	TC-13OUT-W	W	TDP	1846		0.017
		PP-1290	TC-FD1-W	W	TDP	1847		0.012
		PP-1291	TC-EB1-W	W	TDP	1848		0.002
2/21/01	2/20/01	PP-1292	TC-HC-W	W	SRP	1849	0.005	
		PP-1293	TC-3IN-W	W	SRP	1850	0.006	
		PP-1294	TC-3OUT-W	W	SRP	1851	0.002	
		PP-1295	TC-8IN-W	W	SRP	1852	0.007	
		PP-1296	TC-8OUT-W	W	SRP	1853	0.004	
		PP-1297	TC-13IN-W	W	SRP	1854	0.008	
		PP-1298	TC-13OUT-W	W	SRP	1855	0.003	
		PP-1299	TC-FD1-W	W	SRP	1856	0.002	
2/21/01	2/20/01	PP-1300	TC-EB1-W	W	SRP	1857	0.002	

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			Project: PSTA Water samples					
			Sampling: February 2001					
			3/20/01					
Log in	Sampling	Field No.	Field ID	Type	Analysis	Lab #	SRP	TP/TDP
Date	Date						mg/L	mg/L
2/21/01	2/20/01	PP-1305	TC-EB1-P	w	TP	1862		0.001
2/28/01	2/27/01	P2-1354	TC-HC-W	W	TP	1863		0.030
		P2-1355	TC-3OUT-W	W	TP	1864		0.023
		P2-1356	TC-8OUT-W	W	TP	1865		0.015
		P2-1357	TC-13OUT-W	W	TP	1866		0.030
		P2-1358	TC-FD1-W	W	TP	1867		0.022
		P2-1359	TC-HC-W	W	TDP	1868		0.015
		P2-1360	TC-3OUT-W	W	TDP	1869		0.015
		P2-1361	TC-8OUT-W	W	TDP	1870		0.008
		P2-1362	TC-13OUT-W	W	TDP	1871		0.019
2/28/01	2/27/01	P2-1363	TC-FD1-W	W	TDP	1872		0.014
2/28/01	2/27/01	P2-1654	TC-HC-W	W	TP	1873		0.022
		P2-1655	TC-8OUT-W	W	TP	1874		0.013
		P2-1656	TC-13OUT-W	W	TP	1875		0.038
		P2-1657	TC-HC-W	W	TDP	1876		0.015
		P2-1658	TC-8OUT-W	W	TDP	1877		0.009
		P2-1659	TC-13OUT-W	W	TDP	1878		0.018
		P2-1660	TC-HC-W	W	SRP	1879	0.003	
		P2-1661	TC-HC-W	W	SRP	1880	0.002	
		P2-1662	TC-HC-W	W	SRP	1881	0.002	
		P2-1663	TC-8OUT-W	W	SRP	1882	0.001	
		P2-1664	TC-8OUT-W	W	SRP	1883	0.001	
		P2-1665	TC-8OUT-W	W	SRP	1884	0.001	
		P2-1666	TC-13OUT-W	W	SRP	1885	0.002	
		P2-1667	TC-13OUT-W	W	SRP	1886	0.002	
		P2-1668	TC-13OUT-W	W	SRP	1887	0.002	

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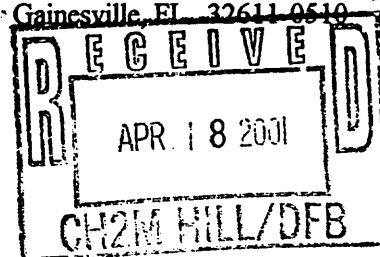
UNIVERSITY OF  
FLORIDA

Institute of Food and Agricultural Sciences  
Soil and Water Science Department



Wetland  
Biogeochemistry  
Laboratory

K. Ramesh Reddy  
202 Newell Hall, PO Box 110510  
Gainesville, FL 32611-0510



Analytical Report No: 2001-3

Project: PSTA-CH2MHILL

Date: 4/12/01

Sample type: Soil/Periphyton/Plant /Fish

Number of samples:

Total phosphorus: 120

Total inorganic phosphorus: 102

Plant/Fish total phosphorus: 47

Ash content: 47

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		WBL ANALYTICAL REPORT 2001-03						
		Project: PSTA Plant and Fish						
		Sampling: February 2001						
		Date: 4/12/2001						
Log in	Samplin	Field No.	Field ID	Type	Analysis	Lab #	Ash cont	TP
Date	Date						%	mg/kg
2/17/01	2/16/01	P2-0723	PP-3-MAC	MC-plant	TP	1784	6.6	729.3
		P2-0724	PP-3-MAC	MC-plant	TP	1785	8.3	657.0
		P2-0725	PP-5-MAC	MC-plant	TP	1786	7.9	520.6
		P2-0726	PP-5-MAC	MC-plant	TP	1787	8.3	788.3
		P2-0727	PP-10-MAC	MC-plant	TP	1788	8.4	366.9
		P2-0728	PP-10-MAC	MC-plant	TP	1789	9.5	285.9
		P2-0729	PP-12-MAC	MC-plant	TP	1790	4.4	402.9
		P2-0730	PP-12-MAC	MC-plant	TP	1791	5.0	441.1
		P2-0731	PP-14-MAC	MC-plant	TP	1792	4.4	297.1
		P2-0732	PP-14-MAC	MC-plant	TP	1793	3.5	243.6
		P2-0733	PP-17-MAC	MC-plant	TP	1794	5.7	383.5
		P2-0734	PP-17-MAC	MC-plant	TP	1795	7.5	243.6
		P2-0735	PP-19-MAC	MC-plant	TP	1796	6.5	556.7
		P2-0736	PP-19 -MAC	MC-plant	TP	1797	5.9	462.4
		P2-0737	PP-20-MAC	MC-plant	TP	1798	11.1	744.8
		P2-0738	PP-20-MAC	MC-plant	TP	1799	9.7	428.3
		P2-0739	PP-FD1-MAC	MC-plant	TP	1800	7.1	676.9
2/17/01	2/16/01	P2-0740	PP-FD2-MAC	MC-plant	TP	1801	8.3	518.0
2/17/01	2/16/01	P2-0741	PP-3-RTS	MC-plant	TP	1802	36.5	953.7
		P2-0742	PP-3-RTS	MC-plant	TP	1803	39.8	1008.5
		P2-0743	PP-5-RTS	MC-plant	TP	1804	29.0	1152.2
		P2-0744	PP-5-RTS	MC-plant	TP	1805	21.3	1140.8
		P2-0745	PP-10-RTS	MC-plant	TP	1806	24.9	565.2
		P2-0746	PP-10-RTS	MC-plant	TP	1807	20.5	1041.1
		P2-0747	PP-12-RTS	MC-plant	TP	1808	6.9	1185.2
		P2-0748	PP-12-RTS	MC-plant	TP	1809	6.4	1554.2
		P2-0749	PP-14-RTS	MC-plant	TP	1810	7.4	660.2
		P2-0750	PP-14-RTS	MC-plant	TP	1811	7.3	432.5
		P2-0751	PP-17-RTS	MC-plant	TP	1812	6.4	775.8
		P2-0752	PP-17-RTS	MC-plant	TP	1813	8.1	648.3
		P2-0753	PP-19-RTS	MC-plant	TP	1814	11.9	1499.1
		P2-0754	PP-19 -RTS	MC-plant	TP	1815	8.7	1168.0
		P2-0755	PP-20-RTS	MC-plant	TP	1816	28.6	1470.4
		P2-0756	PP-20-RTS	MC-plant	TP	1817	34.7	1084.6
		P2-0757	PP-FD1-RTS	MC-plant	TP	1818	10.0	1208.9
2/17/01	2/16/01	P2-0758	PP-FD2-RTS	MC-plant	TP	1819	28.3	1400.7
2/17/01	2/16/01	P2-0759	PP-3-CON	FT	TP	1820	93.7	373.5
		P2-0760	PP-5-CON	FT	TP	1821	96.9	668.5
		P2-0761	PP-10-CON	FT	TP	1822	94.0	670.1
		P2-0762	PP-12-CON	FT	TP	1823	73.8	5016.0
		P2-0763	PP-14-CON	FT	TP	1824	93.6	209.7
		P2-0764	PP-17-CON	FT	TP	1825	85.7	1980.7
		P2-0765	PP-19-CON	FT	TP	1826	86.0	4066.7
		P2-0766	PP-20-CON	FT	TP	1827	94.5	160.6
		P2-0767	PP-21-CON	FT	TP	1828	79.8	1466.3
		P2-0768	PP-22-CON	FT	TP	1829	58.3	2714.5
2/17/01	2/16/01	P2-0769	PP-FD1-CON	FT	TP	1830	73.7	4955.1

			WBL ANALYTICAL REPORT 2001-03					
			Project: PSTA Soil					
			Sampling: February 2001					
			Date: 4/12/2001					
Log in	Sampling							
Date	Date	Field No.	Field ID	Type	Analysis	Lab #	TPi	TP
							mg/kg	mg/kg
2/9/01	2/8/01	P2-1620	FS-1-INF	Soil	TP,TPi	1511	56.5	86.1
		P2-1621	FS-1-CTR	Soil	TP,TPi	1512	67.9	129.0
		P2-1622	FS-1-OUT	Soil	TP,TPi	1513	75.9	106.6
		P2-1623	FS-2-INF	Soil	TP,TPi	1514	57.6	92.3
		P2-1624	FS-2-CTR	Soil	TP,TPi	1515	75.6	98.9
		P2-1625	FS-2-OUT	Soil	TP,TPi	1516	78.2	104.1
		P2-1626	FS-3-INF	Soil	TP,TPi	1517	142.3	161.3
		P2-1627	FS-3-CTR	Soil	TP,TPi	1518	35.8	46.5
		P2-1628	FS-3-OUT	Soil	TP,TPi	1519	48.2	84.1
		P2-1629	FS-4-INF	Soil	TP,TPi	1520	37.6	407.5
		P2-1630	FS-4-CTR	Soil	TP,TPi	1521	52.1	276.1
		P2-1631	FS-4-OUT	Soil	TP,TPi	1522	41.3	401.3
2/9/01	2/8/01	P2-1632	FS-FD1	Soil	TP,TPi	1523	63.1	128.6
2/17/01	2/16/01	P2-0672	PP-3-UPR	Soil	TP, TPi	1743	982.4	973.8
		P2-0673	PP-3-UPR	Soil	TP	1744		1057.7
		P2-0674	PP-5-UPR	Soil	TP, TPi	1745	994.0	965.2
		P2-0675	PP-5-UPR	Soil	TP	1746		1065.5
		P2-0676	PP-10-UPR	Soil	TP, TPi	1747	935.2	876.4
		P2-0677	PP-10-UPR	Soil	TP	1748		1038.1
		P2-0678	PP-12-UPR	Soil	TP, TPi	1749	145.7	131.9
		P2-0679	PP-12-UPR	Soil	TP	1750		113.4
		P2-0680	PP-14-UPR	Soil	TP, TPi	1751	44.6	128.2
		P2-0681	PP-14-UPR	Soil	TP	1752		86.5
		P2-0682	PP-17-UPR	Soil	TP, TPi	1753	90.8	141.1
		P2-0683	PP-17-UPR	Soil	TP	1754		131.7
		P2-0684	PP-19 -UPR	Soil	TP, TPi	1755	10.5	24.5
		P2-0685	PP-19-UPR	Soil	TP	1756		23.2
		P2-0686	PP-20-UPR	Soil	TP, TPi	1757	9.8	19.5
		P2-0687	PP-20-UPR	Soil	TP	1758		17.4
		P2-0688	PP-FD1-UP	Soil	TP, TPi	1759	10.3	23.8
2/17/01	2/16/01	P2-0689	PP-FD2-UP	Soil	TP	1760		1093.6
2/17/01	2/16/01	P2-0693	PP-3-LWR	Soil	TP, TPi	1763	964.5	970.5
		P2-0694	PP-3-LWR	Soil	TP	1764		965.0
		P2-0695	PP-5-LWR	Soil	TP, TPi	1765	844.2	875.6
		P2-0696	PP-5-LWR	Soil	TP	1766		850.1
		P2-0697	PP-10-LWR	Soil	TP, TPi	1767	907.5	916.5
		P2-0698	PP-10-LWR	Soil	TP	1768		973.4
		P2-0699	PP-12-LWR	Soil	TP, TPi	1769	115.0	144.1
		P2-0700	PP-12-LWR	Soil	TP	1770		139.8
		P2-0701	PP-14-LWR	Soil	TP, TPi	1771	81.6	148.7
		P2-0702	PP-14-LWR	Soil	TP	1772		129.5
		P2-0703	PP-17-LWR	Soil	TP, TPi	1773	87.9	135.5
		P2-0704	PP-17-LWR	Soil	TP	1774		117.2
		P2-0705	PP-19 -LWR	Soil	TP, TPi	1775	9.2	16.7
		P2-0706	PP-19-LWR	Soil	TP	1776		15.9
		P2-0707	PP-20-LWR	Soil	TP, TPi	1777	6.8	19.0
		P2-0708	PP-20-LWR	Soil	TP	1778		21.7
		P2-0709	P-FD1-LW	Soil	TP, TPi	1779	8.0	16.2
		P2-0710	P-FD2-LW	Soil	TP	1780		993.9
2/17/01	2/16/01	P2-0711	P-FD3-LW	Soil	TP	1781	890.5	898.5

			WBL ANALYTICAL REPORT 2001-03					
			Project: PSTA Periphyton					
			Sampling: February 2001					
			Date: 4/12/2001					
Log in	Sampling	Field No.	Field ID	Type	Analysis	Lab #	TPi	TP
Date	Date						mg/L	mg/kg
2/17/01	2/16/01	P2-0600	PP-3-FP	Peri	TP, TPi	1675	6.498	383.7
		P2-0601	PP-3-FP	Peri	TP	1676	6.465	367.3
		P2-0602	PP-5-FP	Peri	TP, TPi	1677	5.116	287.9
		P2-0603	PP-5-FP	Peri	TP	1678	5.321	309.1
		P2-0604	PP-10-FP	Peri	TP, TPi	1679	1.986	210.1
		P2-0605	PP-10-FP	Peri	TP	1680	2.423	216.1
		P2-0608	PP-14-FP	Peri	TP, TPi	1681	3.001	721.8
		P2-0609	PP-14-FP	Peri	TP	1682	2.924	690.3
		P2-0610	PP-17-FP	Peri	TP, TPi	1683	0.523	446.6
		P2-0611	PP-17-FP	Peri	TP	1684	0.601	396.5
		P2-0612	PP-19-FP	Peri	TP, TPi	1685	0.914	230.5
		P2-0613	PP-19-FP	Peri	TP	1686	1.324	219.6
		P2-0614	PP-20-FP	Peri	TP, TPi	1687	2.327	281.4
		P2-0615	PP-20-FP	Peri	TP	1688	2.038	284.2
		P2-0616	PP-21-FP	Peri	TP, TPi	1689	1.766	175.6
		P2-0617	PP-21-FP	Peri	TP	1690	1.984	170.7
		P2-0618	PP-22-FP	Peri	TP, TPi	1691	2.323	176.5
		P2-0619	PP-22-FP	Peri	TP	1692	2.699	180.5
		P2-0620	PP-FD1-FP	Peri	TP, TPi	1693	1.614	236.6
2/17/01	2/16/01	P2-0621	PPFD2-FP	Peri	TP	1694	1.043	215.8
2/17/01	2/16/01	P2-0624	PP-3-WP	Peri	TP, TPi	1697	4.718	199.4
		P2-0625	PP-3-WP	Peri	TP	1698	3.215	189.9
		P2-0626	PP-5-WP	Peri	TP, TPi	1699	4.357	293.1
		P2-0627	PP-5-WP	Peri	TP	1700	3.587	316.8
		P2-0628	PP-10-WP	Peri	TP, TPi	1701	3.041	156.6
		P2-0629	PP-10-WP	Peri	TP	1702	3.056	155.6
		P2-0630	PP-12-WP	Peri	TP, TPi	1703	1.751	236.4
		P2-0631	PP-12-WP	Peri	TP	1704	1.614	253.6
		P2-0632	PP-14-WP	Peri	TP, TPi	1705	3.837	588.6
		P2-0633	PP-14-WP	Peri	TP	1706	4.115	619.4
		P2-0634	PP-17-WP	Peri	TP, TPi	1707	2.695	637.3
		P2-0635	PP-17-WP	Peri	TP	1708	3.742	641.8
		P2-0636	PP-19-WP	Peri	TP, TPi	1709	1.398	157.4
		P2-0637	PP-19-WP	Peri	TP	1710	1.998	162.3
		P2-0638	PP-20-WP	Peri	TP, TPi	1711	0.146	720.8
		P2-0639	PP-20-WP	Peri	TP	1712	0.322	635.6
		P2-0640	PP-21-WP	Peri	TP, TPi	1713	0.756	155.2
		P2-0641	PP-21-WP	Peri	TP	1714	0.870	150.3
		P2-0642	PP-22-WP	Peri	TP, TPi	1715	0.854	172.7
		P2-0643	PP-22-WP	Peri	TP	1716	1.003	172.9
		P2-0644	PP-FD1-WP	Peri	TP	1717	0.149	701.1
2/17/01	2/16/01	P2-0645	PPFD2WP	Peri	TP	1718	1.273	168.2

			WBL ANALYTICAL REPORT 2001-03					
			Project: PSTA Periphyton					
			Sampling: February 2001					
			Date: 4/12/2001					
Log in	Sampling	Field No.	Field ID	Type	Analysis	Lab #	TPi	TP
Date	Date						mg/L	mg/kg
2/17/01	2/16/01	P2-0648	PP-3-BP	Peri	TP, TPi	1721	18.387	527.0
		P2-0649	PP-3-BP	Peri	TP	1722	14.679	650.2
		P2-0650	PP-5-BP	Peri	TP, TPi	1723	17.612	502.2
		P2-0651	PP-5-BP	Peri	TP	1724	13.952	491.1
		P2-0652	PP-10-BP	Peri	TP, TPi	1725	10.286	550.1
		P2-0653	PP-10-BP	Peri	TP	1726	10.202	628.5
		P2-0656	PP-14-BP	Peri	TP, TPi	1727	4.886	772.2
		P2-0657	PP-14 -BP	Peri	TP	1728	5.760	751.2
		P2-0658	PP-17-BP	Peri	TP, TPi	1729	8.41	781.2
		P2-0659	PP-17-BP	Peri	TP	1730	7.33	647.6
		P2-0660	PP-19-BP	Peri	TP, TPi	1731	1.780	323.8
		P2-0661	PP-19-BP	Peri	TP	1732	2.415	289.7
		P2-0662	PP-20-BP	Peri	TP, TPi	1733	2.102	223.4
		P2-0663	PP-20-BP	Peri	TP	1734	2.271	250.0
		P2-0664	PP-21-BP	Peri	TP, TPi	1735	2.015	270.0
		P2-0665	PP-21-BP	Peri	TP	1736	1.439	297.2
		P2-0666	PP-22-BP	Peri	TP, TPi	1737	3.071	283.4
		P2-0667	PP-22-BP	Peri	TP	1738	3.18	283.2
		P2-0668	PP-FD1-BP	Peri	TP, TPi	1739	1.970	171.2
2/17/01	2/16/01	P2-0669	PP-FD2-BP	Peri	TP	1740	1.685	199.7
Log in	Sampling	Field No.	Field ID	Type	Analysis	Lab #	TPi	TP
Date	Date						mg/L	mg/L
1/24/01	1/23/01	P2-1116	TC-3W-P	Per	TP,TPi	1486	1.778	15.59
		P2-1117	TC-8W-P	Per	TP,TPi	1487	0.212	4.30
		P2-1118	TC-13W-P	Per	TP,TPi	1488	1.278	13.14
		P2-1119	TC-FD1	Per	TP,TPi	1489	0.251	4.46
2/21/01	2/20/01	PP-1301	TC-3OUT-W	Peri	TP, TPi	1858	0.807	8.12
		PP-1302	TC-8OUT-W	Peri	TP, TPi	1859	0.256	5.45
		PP-1303	TC-13OUT-W	Peri	TP, TPi	1860	1.425	7.55
		PP-1304	TC-FD1-W	Peri	TP, TPi	1861	0.253	5.37



[illegible]

# WAR Lab Reports

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Environmental Engineers,  
Biologists, & Planners

## water & air RESEARCH, INC.

March 30, 2001

Ms. Ellen Patterson  
CH2M Hill  
800 Fairway Drive, Suite 350  
Deerfield Beach, Florida 33441

Dear Ms. Patterson:

Enclosed are the diatom enumeration results for samples collected during the destructive sampling of the Porta PSTAs in the Everglades Nutrient Removal project area. Ten samples were analyzed, one (replicate A) from the downstream (OP) end of each tank sampled. I have included a copy of the specific procedure used during analyses of the samples. Also enclosed is a copy of general and specific comments regarding the sample results. The tables of results have been submitted unbound to facilitate your copying them if necessary and binding them in the manner you choose.

The enclosed computer disk contains a file (PS040.XLS) in Microsoft Excel format listing the diatom names and relative percentages of each taxa as presented in the table of results.

Please review this data set and call me if you have any questions or comments on the results.

Sincerely,

Michael K. Hein  
Staff Scientist

Enclosures

HEIN\WPW\INCH2M\WP70\CH02-01A.WPD 0111001

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## General and Specific Comments

## **Periphyton Stormwater Treatment Area (PSTA) Project Destructive Sampling Diatom Analyses Comments**

### **A. GENERAL COMMENTS**

1. Analyses of the February samples from the destructive sampling of the Porta PSTAs followed Water & Air's standard procedures for inverted microscope analyses and detailed diatom enumerations from permanent slides (a brief copy of the procedures used is enclosed).
2. Densities of diatoms considered "Alive" at the time of collection for the samples analyzed were highest on a per milliliter of sample basis in Sample PP3-OP-A (152,610 cells per milliliter) and lowest in Sample PP12-OP-A (578 cells per milliliter). Percentages of "Dead" diatoms ranged from 22.8 in Sample PP19-OP-A to 46.1 in Sample PP21-OP-A.
3. Taxa that accounted for at least 10% of the valves enumerated in a sample included *Achnanthes minutissimum*, *Cymbella pusilla*, *Encyonema evergladianum*, *Fragilaria famelica*, *Fragilaria synegrotesca*, *Mastogloia smithii* var. *lacustris*, and *Nitzschia semirobusta*.

### **B. SPECIFIC COMMENTS ON SAMPLE SET**

1. The taxonomic name for *Cymbella microcephala* has been changed (Krammer 1997) to *Encyonopsis microcephala*. The older name of this taxon was used during analysis of these samples to be consistent with results from previously analyzed samples.
2. The taxonomic name for *Eunotia pectinalis* var. *minor* is now *Eunotia minor* (Krammer & Lange-Bertalot 1991a). The older name of this taxon was used during analysis of these samples to be consistent with results from previously analyzed samples.
3. Some of the specimens listed as *Nitzschia linearis* var. *subtilis* also appeared similar to *N. gessneri* (Krammer & Lange-Bertalot 1988, p. 106, pl. 77, fig. 11-14) but could not be confirmed or separated because of the small number of specimens observed.
4. Some of the specimens listed as *Eunotia glacialis* in Sample PP14-OP-A may be *E. pectinalis*. Most of the valves enumerated for this taxon were frustules observed in girdle view and separation of these two taxa was difficult.

5. A few of the specimens listed as *Achnantheidium minutissimum* approached the size range and characteristics of *Achnantheidium minutissimum* var. ? illustrated in Krammer & Lange-Bertalot (1991b, p. 60, pl. 32, fig. 27-30).

## Sample Analysis Procedures

## **Diatom Identification/Enumeration Procedure for Periphyton Stormwater Treatment Area (PSTA) Project Destructive Sampling**

Upon arrival, the 60 formalin preserved samples were checked against the chain-of-custody form and logged into a permanent sample logbook. The samples were stored at room temperature (in the dark when possible) until analyzed. Two types of analyses were done for each of the samples analyzed. Because the Porta PSTAs had been in use for more than a year under various environmental conditions, the samples were first analyzed to determine the percentage of live (at the time of collection) versus dead diatoms and visual verifications made of their taxonomic distribution. A second aliquot was cleaned (all organic material oxidized) and permanent slide mounts made for critical determination of the relative percentages of the diatom taxa in the samples.

The determination of live versus dead diatoms in the samples was done using the Utermöhl (1931, 1958) method for inverted microscope examination. After each sample was thoroughly mixed by shaking, a known aliquot of 1 to 5 milliliters (mL) (following serial dilution if necessary) was transferred into a standardized plankton sedimentation chamber with a known settling area of 397.6 square millimeters (mm<sup>2</sup>). Following 24 hours of settling (or at least 4 hours per centimeter of solution height in the chamber), the chamber was placed on a Zeiss inverted microscope (magnification to 1,000X).

The chamber was initially scanned at lower magnifications to confirm an even distribution of organisms in the chamber. Live versus dead diatom counts were made at 1,000X magnification by counting all diatoms within the field of view along at least one central transect of the chamber. Diatoms were considered living at the time of collection if the chromoplast was still present in the cell. Diatoms were considered dead at the time of collection if only empty frustules or small droplets of oil were present in the frustule.

"Alive" and "Dead" cells were enumerated and recorded on standardized bench sheets and later converted to the number of cells per milliliter (mL) using the following conversion equation and Water & Air's WARSTAT computer program:

$$\text{cells/mL} = \frac{C A_c}{N_t A_t V_a}$$

where C = number of cells counted

$A_c$  = area of chamber bottom (397.6 mm<sup>2</sup>)

$N_t$  = number of transects counted

$A_t$  = area of one transect at 1,000X magnification (4.95 mm<sup>2</sup>)

$V_a$  = volume of aliquot (mL) settled

Critical determination of the relative percentages of the diatom taxa in the samples was facilitated by cleaning approximately 30 ml of each sample with hydrogen peroxide and potassium dichromate to oxidize the organic matter including that contained within the diatoms (APHA, AWWA, and WEF 1998, p. 10-33). Following completion of the oxidation reaction, the samples were rinsed several times to remove the chemicals by filling the beakers with distilled water, letting them stand overnight, and decanting the supernatant above the settled diatoms. After the oxidation reaction chemicals had been rinsed from the samples, concentrated hydrochloric acid was added to the samples slowly to dissolve any calcium carbonate present. The samples were rinsed several more times until the pH returned to near neutral. Permanent slides were made of the cleaned diatoms with Naphrax mounting medium. Enumerations of diatom valves to determine relative abundances were made from these slides with a modified Olympus BHS compound microscope equipped with Normarski Differential Interference Contrast (DIC) optics. All diatoms were identified to species when possible using standard taxonomic references. Approximately 500 diatom valves were enumerated for each sample analyzed except for two samples (PP12-OP-A, 226 valves; PP17-OP-A, 427 valves) because of the low density of diatoms on the slides and in the samples.

## References

- American Public Health Association, American Water Works Association, and Water Environment Federation (APHA, AWWA, and WEF). 1998. Standard Methods for the Examination of Water and Wastewater. 20th ed. American Public Health Association, Washington, D.C. 1,000+ pp.
- Krammer, K. & H. Lange-Bertalot. 1988. Bacillariophyceae, Teil 2: Bacillariaceae, Epithemiaceae, Surirellaceae. In A. Pascher (ed.), Süßwasserflora von Mitteleuropa, Vol. 2/2. Gustav Fischer Verlag, Stuttgart, W. Germany. 596 pp.
- Krammer, K. 1997. Die cymbelloiden Diatomeen, Eine Monographie der weltweit bekannten Taxa, Teil 2. *Encyonema* part., *Encyonopsis* and *Cymbellopsis*. Bibliotheca Diatomologica 37:1-469.
- Krammer, K. & H. Lange-Bertalot. 1991a. Bacillariophyceae, Teil 3: Centrales, Fragilariaceae, Eunotiaceae. In A. Pascher (ed.), Süßwasserflora von Mitteleuropa, Vol. 2/3. Gustav Fischer Verlag, Stuttgart, W. Germany. 567 pp.
- Krammer, K. & H. Lange-Bertalot. 1991b. Bacillariophyceae, Teil 4: Achnanthaceae. In A. Pascher (ed.), Süßwasserflora von Mitteleuropa, Vol. 2/4. Gustav Fischer Verlag, Stuttgart, W. Germany. 437 pp.
- Utermöhl, H. 1931. Neue Wege in der Quantitativen Erfassung des Planktons. International Vereinigung für Theoretische und Angewandte Limnologie, Verhandlungen 5:567-596.
- Utermöhl, H. 1958. Zur Vervollkommnung der Quantitativen Phytoplankton Methodik. International Vereinigung für Theoretische und Angewandte Limnologie, Mitteilung 9:1-38.



## Alive Versus Dead Diatom Results

PERIPHYTON STORMWATER TREATMENT AREA (PSTA) PROJECT  
 EVERGLADES NUTRIENT REMOVAL PROJECT - PORTA PSTA DEMOLITION  
 PERIPHYTON/PHYTOPLANKTON ANALYSES - SAMPLED FEBRUARY 2001

Cells Per Milliliter

TAXONOMIC CLASSIFICATION	SAMPLE NO. DATE TIME	PP3-OPA 021301 1225	PP5-OPA 021301 1520	PP10-OPA 021401 0935	PP12-OPA 021401 1130	PP14-OPA 021401 1155
DIVISION CHRYSOPHYTA CLASS BACILLARIOPHYCEAE (DIATOMS)						
ALIVE		152610	7213	20643	578	2297
DEAD		48996	2699	10843	289	1285
TOTAL NUMBER OF ORGANISMS		201606	9912	31486	867	3582
NUMBER OF TAXA		2	2	2	2	2

PERIPHYTON STORMWATER TREATMENT AREA (PSTA) PROJECT  
 EVERGLADES NUTRIENT REMOVAL PROJECT - PORTA PSTA DEMOLITION  
 PERIPHYTON/PHYTOPLANKTON ANALYSES - SAMPLED FEBRUARY 2001

Cells Per Milliliter

TAXONOMIC CLASSIFICATION	SAMPLE NO. DATE TIME	PP17-OPA 021501 0910	PP19-OPA 021301 0850	PP20-OPA 021201 1630	PP21-OPA 021201 1430	PP22-OPA 021201 1400
ALIVE		1478	96386	6795	27952	79920
DEAD		530	28514	2088	23936	41767
TOTAL NUMBER OF ORGANISMS		2008	124900	8883	51888	121687
NUMBER OF TAXA		2	2	2	2	2

PERIPHYTON STORMWATER TREATMENT AREA (PSTA) PROJECT  
 EVERGLADES NUTRIENT REMOVAL PROJECT - PORTA PSTA DEMOLITION  
 PERIPHYTON/PHYTOPLANKTON ANALYSES - SAMPLED FEBRUARY 2001

PERCENT BY DENSITY

TAXONOMIC CLASSIFICATION	SAMPLE NO. DATE TIME	PP3-OPA 021301 1225	PP5-OPA 021301 1520	PP10-OPA 021401 0935	PP12-OPA 021401 1130	PP14-OPA 021401 1155
DIVISION CHRYSOPHYTA CLASS BACILLARIOPHYCEAE (DIATOMS)						
ALIVE		75.7	72.8	65.6	66.7	64.1
DEAD		24.3	27.2	34.4	33.3	35.9
TOTAL		100	100	100	100	100
NUMBER OF TAXA		2	2	2	2	2

PERIPHYTON STORMWATER TREATMENT AREA (PSTA) PROJECT  
 EVERGLADES NUTRIENT REMOVAL PROJECT - PORTA PSTA DEMOLITION  
 PERIPHYTON/PHYTOPLANKTON ANALYSES - SAMPLED FEBRUARY 2001

PERCENT BY DENSITY

TAXONOMIC CLASSIFICATION	SAMPLE NO. DATE TIME	PP17-OPA 021501 0910	PP19-OPA 021301 0850	PP20-OPA 021201 1630	PP21-OPA 021201 1430	PP22-OPA 021201 1400
ALIVE		73.6	77.2	76.5	53.9	65.7
DEAD		26.4	22.8	23.5	46.1	34.3
TOTAL		100	100	100	100	100
NUMBER OF TAXA		2	2	2	2	2

## Diatom Percent Abundance Results

PERIPHYTON STORMWATER TREATMENT AREA (PSTA) PROJECT  
EVERGLADES NUTRIENT REMOVAL PROJECT - PORTA PSTA DEMOLITION  
PERIPHYTON/PHYTOPLANKTON ANALYSES - SAMPLED FEBRUARY 2001

PERCENT BY DENSITY

TAXONOMIC CLASSIFICATION	SAMPLE NO. DATE TIME	PP3-OPA 021301 1225	PP5-OPA 021301 1520	PP10-OPA 021401 0935	PP12-OPA 021401 1130	PP14-OPA 021401 1155
DIVISION CHRYSOPHYTA						
CLASS BACILLARIOPHYCEAE (DIATOMS)						
ACHNANTHES PUSILLA		--	--	--	1.4	--
ACHNANTHIDIUM MINUTISSIMUM		2.0	11.8	6.5	60.8	28.0
AMPHIPLEURA PELLUCIDA		--	--	--	--	--
BRACHYSIRA NEOEXILIS		1.0	--	0.4	--	--
BRACHYSIRA VITREA		8.4	3.3	3.6	1.4	0.8
CYCLOTELLA MENECHINIANA		0.2	--	--	1.4	0.4
CYMBELLA MICROCEPHALA		2.5	4.4	0.6	1.4	8.2
CYMBELLA PUSILLA		11.7	13.9	4.5	4.1	3.9
DIPLONEIS OBLONGELLA		0.4	0.4	0.4	1.4	0.4
DIPLONEIS OVALIS		0.4	0.8	--	<0.1	0.8
ENCYONEMA EVERGLADIANUM		17.4	48.4	9.9	5.4	4.3
ENCYONEMA HEBRIDICA		--	--	--	--	--
ENCYONEMA MINUTUM		--	--	--	1.4	--
ENCYONEMA SILESIACUM		0.4	--	--	--	--
ENCYONEMA SILESIACUM V ELEGANS		--	--	--	--	--
ENCYONEMA VULGARE		2.0	0.8	0.2	--	0.4
EUNOTIA GLACIALIS		--	--	0.2	1.4	3.9
EUNOTIA PECTINALIS V MINOR		0.4	0.8	1.8	--	--
FRAGILARIA FAMELICA		3.5	--	3.4	--	1.2
FRAGILARIA FASCICULATA?		--	--	--	--	--
FRAGILARIA SYNEGROTESCA		14.7	7.3	25.5	--	17.5
FRAGILARIA ULNA		--	--	--	--	--
GOMPHONEMA AFFINE		--	--	--	--	--
GOMPHONEMA GRACILE		0.2	--	--	2.7	2.3
GOMPHONEMA INTRICATUM V VIBRIO		1.0	0.4	1.2	1.4	1.2
GOMPHONEMA PARVULUM		--	--	--	1.4	--
GYROSIGMA OBSCURUM?		--	--	--	<0.1	--
MASTOGLOIA LANCEOLATA		--	--	--	--	--
MASTOGLOIA SMITHII		0.4	0.2	0.2	--	2.7
MASTOGLOIA SMITHII V LACUSTRIS		29.4	3.7	24.1	6.8	6.6
NAVICULA CRYPTOTENELLA		0.2	--	--	--	1.6
NAVICULA PODZORSKII		0.4	0.6	--	<0.1	1.2
NAVICULA RADIOSA		--	--	--	--	--
NAVICULA RADIOSA V PARVA		--	--	--	--	1.9
NITZSCHIA FRUSTULUM		--	--	--	<0.1	--
NITZSCHIA LINEARIS V SUBTILUS		2.7	0.2	0.6	<0.1	0.4
NITZSCHIA PALEA		--	0.2	--	<0.1	--
NITZSCHIA PALEACEA		--	--	--	--	--
NITZSCHIA PALEAFORMIS		0.6	0.4	0.8	1.4	1.2
NITZSCHIA SEMIROBUSTA		--	2.3	15.2	6.8	10.1
NITZSCHIA SERPENTIRAPHE		0.2	0.4	0.8	--	--
NITZSCHIA SP (SMALL)		--	--	--	--	--
RHOPALODIA GIBBA		--	--	0.2	--	1.2
SELLAPHORA LAEVISSIMA		--	--	--	--	--
TOTAL		100	100	100	101	100
NUMBER OF TAXA		23	19	20	22	23

PERIPHYTON STORMWATER TREATMENT AREA (PSTA) PROJECT  
EVERGLADES NUTRIENT REMOVAL PROJECT - PORTA PSTA DEMOLITION  
PERIPHYTON/PHYTOPLANKTON ANALYSES - SAMPLED FEBRUARY 2001

PERCENT BY DENSITY

TAXONOMIC CLASSIFICATION	SAMPLE NO. DATE TIME	PP17-OPA 021501 0910	PP19-OPA 021301 0850	PP20-OPA 021201 1630	PP21-OPA 021201 1430	PP22-OPA 021201 1400
ACHNANTHES PUSILLA		<0.1	--	1.2	--	--
ACHNANTHIDIUM MINUTISSIMUM		39.7	4.1	32.8	--	2.9
AMPHIPLEURA PELLUCIDA		--	--	0.4	--	--
BRACHYSIRA NEOEXILIS		0.7	0.4	--	0.4	--
BRACHYSIRA VITREA		2.1	0.1	--	--	0.8
CYCLOTELLA MENEGHINIANA		--	--	--	--	--
CYMBELLA MICROCEPHALA		1.4	0.6	8.8	0.9	0.2
CYMBELLA PUSILLA		3.5	13.0	3.1	10.7	5.3
DIPLONEIS OBLONGELLA		--	0.1	--	--	--
DIPLONEIS OVALIS		0.7	0.1	--	0.2	0.2
ENCYONEMA EVERGLADIANUM		3.5	9.3	14.5	11.3	8.6
ENCYONEMA HEBRIDICA		--	--	--	0.4	--
ENCYONEMA MINUTUM		--	--	0.4	--	--
ENCYONEMA SILESIACUM		--	--	--	--	--
ENCYONEMA SILESIACUM V ELEGANS		--	--	--	--	0.2
ENCYONEMA VULGARE		0.7	1.8	0.4	3.0	0.4
EUNOTIA GLACIALIS		0.7	--	--	--	--
EUNOTIA PECTINALIS V MINOR		--	--	--	--	--
FRAGILARIA FAMELICA		0.7	1.9	14.5	9.8	2.9
FRAGILARIA FASCICULATA?		2.8	--	--	--	--
FRAGILARIA SYNEGROTESCA		22.0	18.3	6.3	4.1	32.8
FRAGILARIA ULNA		0.7	--	--	--	--
GOMPHONEMA AFFINE		--	--	--	--	0.4
GOMPHONEMA GRACILE		2.1	--	1.6	0.4	0.8
GOMPHONEMA INTRICATUM V VIBRIO		--	0.4	0.4	0.2	0.8
GOMPHONEMA PARVULUM		--	--	--	--	--
GYROSIGMA OBSCURUM?		--	--	--	--	--
MASTOGLOIA LANCEOLATA		--	--	--	0.2	0.6
MASTOGLOIA SMITHII		--	0.4	0.4	--	--
MASTOGLOIA SMITHII V LACUSTRIS		11.3	46.4	2.1	48.8	33.8
NAVICULA CRYPTOTENELLA		--	--	--	--	--
NAVICULA PODZORSKII		--	--	--	--	--
NAVICULA RADIOSA		--	0.1	--	--	--
NAVICULA RADIOSA V PARVA		<0.1	0.4	3.7	2.4	0.8
NITZSCHIA FRUSTULUM		0.7	--	--	--	0.2
NITZSCHIA LINEARIS V SUBTILUS		--	1.0	2.9	0.2	--
NITZSCHIA PALEA		--	0.1	0.2	0.4	--
NITZSCHIA PALEACEA		<0.1	--	--	--	--
NITZSCHIA PALEAFORMIS		--	--	6.1	4.3	5.3
NITZSCHIA SEMIROBUSTA		5.7	0.1	0.4	1.7	1.2
NITZSCHIA SERPENTIRAPHE		--	0.6	--	0.7	1.2
NITZSCHIA SP (SMALL)		<0.1	--	--	--	--
RHOPALODIA GIBBA		0.7	0.4	--	--	--
SELLAPHORA LAEVISSIMA		--	--	--	--	0.8
TOTAL		100	100	100	100	100
NUMBER OF TAXA		22	21	19	19	21



PERIPHYTON STORMWATER TREATMENT AREA (PSTA) PROJECT  
 EVERGLADES NUTRIENT REMOVAL PROJECT - PORTA PSTA DEMOLITION  
 PERIPHYTON/PHYTOPLANKTON ANALYSES - SAMPLED FEBRUARY 2001

STATION INDICES

SAMPLE NO.	DATE	TIME	SHANNON-WEAVER DIVERSITY BASE 2	EVENNESS (H/Hmax)	EVENNESS (H-Hmin) / (Hmax-Hmin)
PP3-OPA	021301	1225	3.130	0.692	0.658
PP5-OPA	021301	1520	2.584	0.608	0.572
PP10-OPA	021401	0935	3.048	0.705	0.676
PP12-OPA	021401	1130	2.500	0.560	0.456
PP14-OPA	021401	1155	3.432	0.758	0.732
PP17-OPA	021501	0910	2.869	0.643	0.598
PP19-OPA	021301	0850	2.482	0.565	0.520
PP20-OPA	021201	1630	3.113	0.733	0.707
PP21-OPA	021201	1430	2.605	0.613	0.578
PP22-OPA	021201	1400	2.707	0.616	0.577